November 23, 2015

United States Environmental Protection Agency ("USEPA") Region 1
Water Technical Unit (SMR-04)
5 Post Office Square, Suite 100
Boston, Massachusetts 02109-3912

Re: Initial Whole Effluent Toxicity ("WET") Testing
Veolia Energy North America
Kendall Green Energy LLC
265 First Street
Cambridge, MA 02142
NPDES Permit No. MA0004898

To Whom It May Concern:

AMEC Massachusetts, Inc. ("AMEC"), on behalf of Kendall Green Energy LLC ("Kendall"), is providing this notification of initial WET testing as required in the facility's National Pollutant Discharge Elimination System ("NPDES") permit Effective on February 1, 2011.

Kendall began discharge of ultrafiltration ("UF") backwash and reverse osmosis ("RO") reject wastewater near the end of August 2015 and scheduled sampling for WET testing in the beginning of September. The sampling contractor attempted to obtain a composite sample of discharge at the beginning of September, but was unsuccessful due to the configuration of the outfall sampling manifold and the volume of wastewater that is needed for WET testing. Since this was Kendall's first WET testing sampling event, sampling manifold limitations were previously unknown. In response, Kendall redesigned its outfall sampling station and installed a new sampling manifold to allow for proper sampling. This manifold was installed mid-September and sampling rescheduled for September 20, 2015.

Composite samples for 3rd quarter 2015 WET testing were successfully collected from September 20th to 21st, 22nd to 23rd and 24th to 25th and delivered to the laboratory for analysis. The M. Beryllina assay was started on September 22, 2015 and completed on September 29, 2015. The *A. punctulata* assay was started on September 24, 2015, but failed to meet the test acceptability criterion for fertilization in the receiving water diluent and all test concentrations. Samples were again collected from October 15th to 16th and the *A. punctulata* assay was successfully repeated starting October 16, 2015 using alternate receiving water from the Hampton/Seabrook Estuary.

Kendall informed Ms. Shelley Puleo of the above events in a phone conversation followed by an email on November 10, 2015 to ensure USEPA that their 3rd quarter 2015 WET testing results would be submitted.

Per the requirements of Part I.A. Effluent Limitations and Monitoring Requirements of Kendall's NPDES Permit, WET testing results were as follows:

AMEC Massachusetts, Inc.
271 Mill Road, 3rd Floor
Chelmsford, MA 01824
+1 978-692-9090
amecfw.com

Acute Toxicity Evaluation

Species	**LC-50 48 Hours**
M. Bryllina	>100%

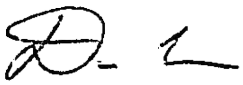
Chronic Toxicity Evaluation

Species	**C-NOEC**
M. Bryllina	>100%
A. Punctulata	50%

These tests followed the requirements of Attachment C2 for marine species due to the salinity of the intake water being greater than one part per trillion. WET test sampling for the 4th quarter 2015 was conducted on November 13, 2015.

Please feel free to contact me if you have any questions or require any additional information. Thank you for your consideration.

Sincerely,
AMEC
By,



David Lachance, EIT
Senior Program Director
Phone: 978-392-5360
David.Lachance@amec.com

Enclosures: NPDES Bioassay, October 30, 2015

Cc: Sean Caldwell, Veolia
Jim Harrison, Veolia
Paul Richard, AMEC

CERTIFICATE OF ANALYSIS

James Harrison
Veolia
265 First Street
Cambridge, MA 02142

RE: NPDES Bioassay (N/A)
ESS Laboratory Work Order Number: 1509567

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 2:06 pm, Oct 30, 2015

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with NELAC Standards, A2LA and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

Subcontracted Analyses

EnviroSystems, Inc. - Hampton, NH	Bioassay
Microbac Laboratories - Maryville, TN	Total Organic Carbon

CERTIFICATE OF ANALYSIS

Client Name: Veolia
Client Project ID: NPDES Bioassay

ESS Laboratory Work Order: 1509567

SAMPLE RECEIPT

The following samples were received on September 21, 2015 for the analyses specified on the enclosed Chain of Custody Record.

The samples and analyses listed below were analyzed in accordance with the Guidelines Establishing Test Procedures for the Analysis of Pollutants, 40 CFR Part 136, as amended.

Lab Number	Sample Name	Matrix	Analysis
1509567-01	Receiving Water	Surface Water	§, 120.1, 200.7, 2320B, 2540B, 2540D, 350.1, Field
1509567-02	Final Effluent	Waste Water	§, 120.1, 200.7, 2320B, 2540B, 2540D, 350.1, Field
1509567-03	Receiving Water	Surface Water	§, 120.1, 200.7, 2320B, 2540B, 2540D, 350.1, Field
1509567-04	Final Effluent	Waste Water	§, 120.1, 200.7, 2320B, 2540B, 2540D, 350.1, Field
1509567-05	Receiving Water	Aqueous	§, 120.1, 200.7, 2320B, 2540B, 2540D, 350.1, Field
1509567-06	Final Effluent	Aqueous	§, 120.1, 200.7, 2320B, 2540B, 2540D, 350.1, Field
1509567-07	Effluent Start	Aqueous	n/a
1509567-08	Receiving Water Start	Aqueous	n/a
1509567-09	Effluent First Renewal	Aqueous	n/a
1509567-10	Receiving Water First Renewal	Aqueous	n/a

CERTIFICATE OF ANALYSIS

Client Name: Veolia
Client Project ID: NPDES Bioassay

ESS Laboratory Work Order: 1509567

PROJECT NARRATIVE

Classical Chemistry

1509567-03	**Estimated value. Sample hold times were exceeded (H).**
	Ammonia as N , Conductivity , Total Solids , Total Suspended Solids
1509567-03	**The maximum holding time listed in 40 CFR Part 136 Table II for pH, Dissolved Oxygen, Sulfite and Residual Chlorine is fifteen minutes.**
	Alkalinity as CaCO3
1509567-04	**Estimated value. Sample hold times were exceeded (H).**
	Ammonia as N , Conductivity , Total Solids , Total Suspended Solids
1509567-04	**The maximum holding time listed in 40 CFR Part 136 Table II for pH, Dissolved Oxygen, Sulfite and Residual Chlorine is fifteen minutes.**
	Alkalinity as CaCO3
1509567-05	**Estimated value. Sample hold times were exceeded (H).**
	Ammonia as N , Conductivity , Total Solids , Total Suspended Solids
1509567-05	**The maximum holding time listed in 40 CFR Part 136 Table II for pH, Dissolved Oxygen, Sulfite and Residual Chlorine is fifteen minutes.**
	Alkalinity as CaCO3
1509567-06	**Estimated value. Sample hold times were exceeded (H).**
	Ammonia as N , Conductivity , Total Solids , Total Suspended Solids
1509567-06	**The maximum holding time listed in 40 CFR Part 136 Table II for pH, Dissolved Oxygen, Sulfite and Residual Chlorine is fifteen minutes.**
	Alkalinity as CaCO3

No other observations noted.

End of Project Narrative.

DATA USABILITY LINKS

Definitions of Quality Control Parameters

Semivolatile Organics Internal Standard Information

Semivolatile Organics Surrogate Information

Volatile Organics Internal Standard Information

Volatile Organics Surrogate Information

EPH and VPH Alkane Lists

CERTIFICATE OF ANALYSIS

Client Name: Veolia
Client Project ID: NPDES Bioassay

ESS Laboratory Work Order: 1509567

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015D - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH / VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: Veolia
Client Project ID: NPDES Bioassay
Client Sample ID: Receiving Water
Date Sampled: 09/21/15 13:00
Percent Solids: N/A

ESS Laboratory Work Order: 1509567
ESS Laboratory Sample ID: 1509567-01
Sample Matrix: Surface Water
Units: mg/L

Extraction Method: 3005A/200.7

All methods used are in accordance with 40 CFR 136.

Total Metals

Analyte	Results (MRL)	MDL	Method	MA - Permit Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Aluminum	**0.036** (0.020)		200.7	0.02	1	KJK	09/23/15 20:32	50	10	CI52327
Cadmium	ND (0.0010)		200.7	0.001	1	KJK	09/23/15 20:32	50	10	CI52327
Calcium	**40.2** (0.040)		200.7	0.05	1	KJK	09/23/15 20:32	50	10	CI52327
Chromium	ND (0.002)		200.7	0.005	1	KJK	09/23/15 20:32	50	10	CI52327
Copper	**0.004** (0.002)		200.7	0.0025	1	KJK	09/23/15 20:32	50	10	CI52327
Hardness	**254** (0.265)		200.7		1	KJK	09/23/15 20:32	1	1	[CALC]
Lead	ND (0.004)		200.7	0.005	1	KJK	09/23/15 20:32	50	10	CI52327
Magnesium	**37.3** (0.040)		200.7	0.05	1	KJK	09/23/15 20:32	50	10	CI52327
Nickel	ND (0.002)		200.7	0.004	1	KJK	09/23/15 20:32	50	10	CI52327
Zinc	**0.023** (0.010)		200.7	0.0025	1	KJK	09/23/15 20:32	50	10	CI52327

CERTIFICATE OF ANALYSIS

Client Name: Veolia
Client Project ID: NPDES Bioassay
Client Sample ID: Receiving Water
Date Sampled: 09/21/15 13:00
Percent Solids: N/A

ESS Laboratory Work Order: 1509567
ESS Laboratory Sample ID: 1509567-01
Sample Matrix: Surface Water

All methods used are in accordance with 40 CFR 136.

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	MA - Permit Limit	DF	Analyst	Analyzed	Units	Batch
Alkalinity as CaCO3	**39** (10)		2320B	2	1	MJV	09/25/15 16:56	mg/L	CI52539
Ammonia as N	**0.15** (0.10)		350.1	0.1	1	JLK	09/25/15 8:55	mg/L	CI52403
Conductivity	**1010** (5)		120.1		1	EEM	09/25/15 11:15	umhos/cm	CI52524
Field Dissolved Oxygen	**6.81** (N/A)		Field	1	1	MNM	09/21/15 13:00	mg/L	CI52807
Field pH	**7.82** (N/A)		Field		1	MNM	09/21/15 13:00	S.U.	CI52807
Field Temperature	**23.4** (N/A)		Field		1	MNM	09/21/15 13:00	°C	CI52807
Salinity	**1.10** (N/A)		Field		1	MNM	09/21/15 13:00	S.U.	CI52807
Total Organic Carbon	**9.3** (0.5)		§		1	SUB	09/29/15 18:55	mg/L	CJ50130
Total Residual Chlorine	**0.09** (N/A)		Field	0.05	1	MNM	09/21/15 13:00	mg/L	CI52807
Total Solids	**1540** (10)		2540B		1	EEM	09/25/15 16:35	mg/L	CI52518
Total Suspended Solids	**6** (5)		2540D		1	EEM	09/25/15 17:10	mg/L	CI52519

CERTIFICATE OF ANALYSIS

Client Name: Veolia
Client Project ID: NPDES Bioassay
Client Sample ID: Final Effluent
Date Sampled: 09/21/15 08:00
Percent Solids: N/A

ESS Laboratory Work Order: 1509567
ESS Laboratory Sample ID: 1509567-02
Sample Matrix: Waste Water
Units: mg/L

Extraction Method: 3005A/200.7

All methods used are in accordance with 40 CFR 136.

Total Metals

				MA - Permit						
Analyte	**Results (MRL)**	**MDL**	**Method**	**Limit**	**DF**	**Analyst**	**Analyzed**	**I/V**	**F/V**	**Batch**
Aluminum	**0.097** (0.020)		200.7	0.02	1	KJK	09/23/15 20:37	50	10	CI52327
Cadmium	ND (0.0010)		200.7	0.001	1	KJK	09/23/15 20:37	50	10	CI52327
Calcium	**44.9** (0.040)		200.7	0.05	1	KJK	09/23/15 20:37	50	10	CI52327
Chromium	ND (0.004)		200.7	0.005	1	KJK	09/23/15 20:37	50	10	CI52327
Copper	**0.032** (0.002)		200.7	0.0025	1	KJK	09/23/15 20:37	50	10	CI52327
Hardness	**288** (0.265)		200.7		1	KJK	09/23/15 20:37	1	1	[CALC]
Lead	**0.039** (0.004)		200.7	0.005	1	KJK	09/23/15 20:37	50	10	CI52327
Magnesium	**42.8** (0.040)		200.7	0.05	1	KJK	09/23/15 20:37	50	10	CI52327
Nickel	ND (0.002)		200.7	0.004	1	KJK	09/23/15 20:37	50	10	CI52327
Zinc	**0.122** (0.010)		200.7	0.0025	1	KJK	09/23/15 20:37	50	10	CI52327

CERTIFICATE OF ANALYSIS

Client Name: Veolia
Client Project ID: NPDES Bioassay
Client Sample ID: Final Effluent
Date Sampled: 09/21/15 08:00
Percent Solids: N/A

ESS Laboratory Work Order: 1509567
ESS Laboratory Sample ID: 1509567-02
Sample Matrix: Waste Water

All methods used are in accordance with 40 CFR 136.

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	MA - Permit Limit	DF	Analyst	Analyzed	Units	Batch
Alkalinity as CaCO3	**60** (10)		2320B	2	1	MJV	09/25/15 16:56	mg/L	CI52539
Ammonia as N	**0.15** (0.10)		350.1	0.1	1	JLK	09/25/15 8:55	mg/L	CI52403
Conductivity	**970** (5)		120.1		1	EEM	09/25/15 11:15	umhos/cm	CI52524
Field Dissolved Oxygen	**6.01** (N/A)		Field	1	1	MNM	09/21/15 8:00	mg/L	CI52807
Field pH	**8.04** (N/A)		Field		1	MNM	09/21/15 8:00	S.U.	CI52807
Field Temperature	**30.2** (N/A)		Field		1	MNM	09/21/15 8:00	°C	CI52807
Salinity	**1.20** (N/A)		Field		1	MNM	09/21/15 8:00	S.U.	CI52807
Total Organic Carbon	**12** (0.5)		§		1	SUB	09/29/15 19:11	mg/L	CJ50130
Total Residual Chlorine	**0.10** (N/A)		Field	0.05	1	MNM	09/21/15 8:00	mg/L	CI52807
Total Solids	**1540** (10)		2540B		1	EEM	09/25/15 16:35	mg/L	CI52518
Total Suspended Solids	**9** (5)		2540D		1	EEM	09/25/15 17:10	mg/L	CI52519

CERTIFICATE OF ANALYSIS

Client Name: Veolia
Client Project ID: NPDES Bioassay
Client Sample ID: Receiving Water
Date Sampled: 09/23/15 11:00
Percent Solids: N/A

ESS Laboratory Work Order: 1509567
ESS Laboratory Sample ID: 1509567-03
Sample Matrix: Surface Water
Units: mg/L

Extraction Method: 3005A/200.7

All methods used are in accordance with 40 CFR 136.

Total Metals

Analyte	Results (MRL)	MDL	Method	MA - Permit Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Aluminum	**0.022** (0.020)		200.7	0.02	1	KJK	10/24/15 23:32	50	10	CJ52267
Cadmium	ND (0.0010)		200.7	0.001	1	KJK	10/24/15 23:32	50	10	CJ52267
Calcium	**43.0** (0.040)		200.7	0.05	1	KJK	10/24/15 23:32	50	10	CJ52267
Chromium	ND (0.004)		200.7	0.005	1	KJK	10/24/15 23:32	50	10	CJ52267
Copper	**0.007** (0.002)		200.7	0.0025	1	KJK	10/24/15 23:32	50	10	CJ52267
Hardness	**302** (0.265)		200.7		1	KJK	10/24/15 23:32	1	1	[CALC]
Hardness	**302** (0.265)		200.7		1	KJK	10/24/15 23:32	1	1	[CALC]
Lead	ND (0.004)		200.7	0.005	1	KJK	10/24/15 23:32	50	10	CJ52267
Magnesium	**47.3** (0.040)		200.7	0.05	1	KJK	10/24/15 23:32	50	10	CJ52267
Nickel	ND (0.002)		200.7	0.004	1	KJK	10/24/15 23:32	50	10	CJ52267
Zinc	**0.024** (0.010)		200.7	0.0025	1	KJK	10/24/15 23:32	50	10	CJ52267

CERTIFICATE OF ANALYSIS

Client Name: Veolia
Client Project ID: NPDES Bioassay
Client Sample ID: Receiving Water
Date Sampled: 09/23/15 11:00
Percent Solids: N/A

ESS Laboratory Work Order: 1509567
ESS Laboratory Sample ID: 1509567-03
Sample Matrix: Surface Water

All methods used are in accordance with 40 CFR 136.

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	MA - Permit Limit	DF	Analyst	Analyzed	Units	Batch
Alkalinity as CaCO3	**HT 59** (10)		2320B	2	1	MJV	10/24/15 14:19	mg/L	CJ52403
Ammonia as N	**H 0.18** (0.10)		350.1	0.1	1	EEM	10/29/15 19:15	mg/L	CJ52304
Conductivity	**H 1630** (5)		120.1		1	EEM	10/26/15 16:15	umhos/cm	CJ52618
Field Dissolved Oxygen	**7.76** (N/A)		Field	1	1	MNM	09/23/15 11:00	mg/L	CJ51545
Field pH	**7.61** (N/A)		Field		1	MNM	09/23/15 11:00	S.U.	CJ51545
Field Temperature	**24.2** (N/A)		Field		1	MNM	09/23/15 11:00	°C	CJ51545
Salinity	**1.20** (N/A)		Field		1	MNM	09/23/15 11:00	S.U.	CJ51545
Total Organic Carbon	**9.9** (0.5)		§		1	SUB	10/23/15 16:09	mg/L	CJ52706
Total Residual Chlorine	**0.14** (N/A)		Field	0.05	1	MNM	09/23/15 11:00	mg/L	CJ51545
Total Solids	**H 1630** (10)		2540B		1	EEM	10/26/15 16:55	mg/L	CJ52621
Total Suspended Solids	**H** ND (5)		2540D		1	EEM	10/23/15 11:20	mg/L	CJ52226

CERTIFICATE OF ANALYSIS

Client Name: Veolia
Client Project ID: NPDES Bioassay
Client Sample ID: Final Effluent
Date Sampled: 09/23/15 08:00
Percent Solids: N/A

ESS Laboratory Work Order: 1509567
ESS Laboratory Sample ID: 1509567-04
Sample Matrix: Waste Water
Units: mg/L

Extraction Method: 3005A/200.7

All methods used are in accordance with 40 CFR 136.

Total Metals

				MA - Permit						
Analyte	**Results (MRL)**	**MDL**	**Method**	**Limit**	**DF**	**Analyst**	**Analyzed**	**I/V**	**F/V**	**Batch**
Aluminum	**0.045** (0.020)		200.7	0.02	1	KJK	10/24/15 23:36	50	10	CJ52267
Cadmium	ND (0.0010)		200.7	0.001	1	KJK	10/24/15 23:36	50	10	CJ52267
Calcium	**44.6** (0.040)		200.7	0.05	1	KJK	10/24/15 23:36	50	10	CJ52267
Chromium	ND (0.004)		200.7	0.005	1	KJK	10/24/15 23:36	50	10	CJ52267
Copper	**0.097** (0.002)		200.7	0.0025	1	KJK	10/24/15 23:36	50	10	CJ52267
Hardness	**313** (0.265)		200.7		1	KJK	10/24/15 23:36	1	1	[CALC]
Hardness	**313** (0.265)		200.7		1	KJK	10/24/15 23:36	1	1	[CALC]
Lead	**0.042** (0.004)		200.7	0.005	1	KJK	10/24/15 23:36	50	10	CJ52267
Magnesium	**49.0** (0.040)		200.7	0.05	1	KJK	10/24/15 23:36	50	10	CJ52267
Nickel	ND (0.002)		200.7	0.004	1	KJK	10/24/15 23:36	50	10	CJ52267
Zinc	**0.063** (0.010)		200.7	0.0025	1	KJK	10/24/15 23:36	50	10	CJ52267

CERTIFICATE OF ANALYSIS

Client Name: Veolia
Client Project ID: NPDES Bioassay
Client Sample ID: Final Effluent
Date Sampled: 09/23/15 08:00
Percent Solids: N/A

ESS Laboratory Work Order: 1509567
ESS Laboratory Sample ID: 1509567-04
Sample Matrix: Waste Water

All methods used are in accordance with 40 CFR 136.

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	MA - Permit Limit	DF	Analyst	Analyzed	Units	Batch
Alkalinity as CaCO3	**HT 58** (10)		2320B	2	1	MJV	10/24/15 14:19	mg/L	CJ52403
Ammonia as N	**H 0.29** (0.10)		350.1	0.1	1	EEM	10/29/15 19:15	mg/L	CJ52304
Conductivity	**H 1590** (5)		120.1		1	EEM	10/26/15 16:15	umhos/cm	CJ52618
Field Dissolved Oxygen	**6.50** (N/A)		Field	1	1	MNM	09/23/15 8:00	mg/L	CJ51545
Field pH	**7.35** (N/A)		Field		1	MNM	09/23/15 8:00	S.U.	CJ51545
Field Temperature	**26.3** (N/A)		Field		1	MNM	09/23/15 8:00	°C	CJ51545
Salinity	**1.40** (N/A)		Field		1	MNM	09/23/15 8:00	S.U.	CJ51545
Total Organic Carbon	**11** (0.5)		§		1	SUB	10/23/15 16:25	mg/L	CJ52706
Total Residual Chlorine	**0.17** (N/A)		Field	0.05	1	MNM	09/23/15 8:00	mg/L	CJ51545
Total Solids	**H 1660** (10)		2540B		1	EEM	10/26/15 16:55	mg/L	CJ52621
Total Suspended Solids	**H** ND (5)		2540D		1	EEM	10/23/15 11:20	mg/L	CJ52226

CERTIFICATE OF ANALYSIS

Client Name: Veolia
Client Project ID: NPDES Bioassay
Client Sample ID: Receiving Water
Date Sampled: 09/25/15 08:55
Percent Solids: N/A

ESS Laboratory Work Order: 1509567
ESS Laboratory Sample ID: 1509567-05
Sample Matrix: Aqueous
Units: mg/L

Extraction Method: 3005A/200.7

All methods used are in accordance with 40 CFR 136.

Total Metals

				MA - Permit						
Analyte	**Results (MRL)**	**MDL**	**Method**	**Limit**	**DF**	**Analyst**	**Analyzed**	**I/V**	**F/V**	**Batch**
Aluminum	**0.033** (0.020)		200.7	0.02	1	KJK	10/25/15 0:07	50	10	CJ52267
Cadmium	ND (0.0010)		200.7	0.001	1	KJK	10/25/15 0:07	50	10	CJ52267
Calcium	**44.9** (0.040)		200.7	0.05	1	KJK	10/25/15 0:07	50	10	CJ52267
Chromium	ND (0.004)		200.7	0.005	1	KJK	10/25/15 0:07	50	10	CJ52267
Copper	**0.007** (0.002)		200.7	0.0025	1	KJK	10/25/15 0:07	50	10	CJ52267
Hardness	**312** (0.265)		200.7		1	KJK	10/25/15 0:07	1	1	[CALC]
Hardness	**312** (0.265)		200.7		1	KJK	10/25/15 0:07	1	1	[CALC]
Lead	ND (0.004)		200.7	0.005	1	KJK	10/25/15 0:07	50	10	CJ52267
Magnesium	**48.6** (0.040)		200.7	0.05	1	KJK	10/25/15 0:07	50	10	CJ52267
Nickel	ND (0.002)		200.7	0.004	1	KJK	10/25/15 0:07	50	10	CJ52267
Zinc	**0.027** (0.010)		200.7	0.0025	1	KJK	10/25/15 0:07	50	10	CJ52267

CERTIFICATE OF ANALYSIS

Client Name: Veolia
Client Project ID: NPDES Bioassay
Client Sample ID: Receiving Water
Date Sampled: 09/25/15 08:55
Percent Solids: N/A

ESS Laboratory Work Order: 1509567
ESS Laboratory Sample ID: 1509567-05
Sample Matrix: Aqueous

All methods used are in accordance with 40 CFR 136.

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	MA - Permit Limit	DF	Analyst	Analyzed	Units	Batch
Alkalinity as CaCO3	**HT 59** (10)		2320B	2	1	MJV	10/24/15 14:19	mg/L	CJ52403
Ammonia as N	**H 0.35** (0.10)		350.1	0.1	1	EEM	10/29/15 19:16	mg/L	CJ52304
Conductivity	**H 1440** (5)		120.1		1	EEM	10/26/15 16:15	umhos/cm	CJ52618
Field Dissolved Oxygen	**6.93** (N/A)		Field	1	1	MNM	09/25/15 8:55	mg/L	CJ51545
Field pH	**7.03** (N/A)		Field		1	MNM	09/25/15 8:55	S.U.	CJ51545
Field Temperature	**22.2** (N/A)		Field		1	MNM	09/25/15 8:55	°C	CJ51545
Salinity	**1.30** (N/A)		Field		1	MNM	09/25/15 8:55	S.U.	CJ51545
Total Organic Carbon	**8.9** (0.5)		§		1	SUB	10/23/15 16:40	mg/L	CJ52706
Total Residual Chlorine	**0.17** (N/A)		Field	0.05	1	MNM	09/25/15 8:55	mg/L	CJ51545
Total Solids	**H 1720** (10)		2540B		1	EEM	10/26/15 16:55	mg/L	CJ52621
Total Suspended Solids	**H** ND (5)		2540D		1	EEM	10/23/15 11:20	mg/L	CJ52226

CERTIFICATE OF ANALYSIS

Client Name: Veolia
Client Project ID: NPDES Bioassay
Client Sample ID: Final Effluent
Date Sampled: 09/25/15 08:00
Percent Solids: N/A

ESS Laboratory Work Order: 1509567
ESS Laboratory Sample ID: 1509567-06
Sample Matrix: Aqueous
Units: mg/L

Extraction Method: 3005A/200.7

All methods used are in accordance with 40 CFR 136.

Total Metals

				MA - Permit						
Analyte	**Results (MRL)**	**MDL**	**Method**	**Limit**	**DF**	**Analyst**	**Analyzed**	**I/V**	**F/V**	**Batch**
Aluminum	ND (0.020)		200.7	0.02	1	ICP	10/25/15 0:11	50	10	CJ52267
Cadmium	ND (0.0010)		200.7	0.001	1	ICP	10/25/15 0:11	50	10	CJ52267
Calcium	**46.2** (0.080)		200.7	0.05	2	ICP	10/26/15 22:49	50	10	CJ52267
Chromium	ND (0.004)		200.7	0.005	1	ICP	10/25/15 0:11	50	10	CJ52267
Copper	**0.134** (0.008)		200.7	0.0025	2	ICP	10/26/15 22:49	50	10	CJ52267
Hardness	**313** (0.529)		200.7		2	ICP	10/26/15 22:49	1	1	[CALC]
Hardness	**313** (0.529)		200.7		2	ICP	10/26/15 22:49	1	1	[CALC]
Lead	**0.019** (0.008)		200.7	0.005	2	ICP	10/26/15 22:49	50	10	CJ52267
Magnesium	**48.1** (0.080)		200.7	0.05	2	ICP	10/26/15 22:49	50	10	CJ52267
Nickel	ND (0.002)		200.7	0.004	1	ICP	10/25/15 0:11	50	10	CJ52267
Zinc	**0.043** (0.020)		200.7	0.0025	2	ICP	10/26/15 22:49	50	10	CJ52267

CERTIFICATE OF ANALYSIS

Client Name: Veolia
Client Project ID: NPDES Bioassay
Client Sample ID: Final Effluent
Date Sampled: 09/25/15 08:00
Percent Solids: N/A

ESS Laboratory Work Order: 1509567
ESS Laboratory Sample ID: 1509567-06
Sample Matrix: Aqueous

All methods used are in accordance with 40 CFR 136.

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	MA - Permit Limit	DF	Analyst	Analyzed	Units	Batch
Alkalinity as CaCO3	**HT 61** (10)		2320B	2	1	MJV	10/24/15 14:19	mg/L	CJ52403
Ammonia as N	**H 0.29** (0.10)		350.1	0.1	1	EEM	10/29/15 19:17	mg/L	CJ52304
Conductivity	**H 1670** (5)		120.1		1	EEM	10/26/15 16:15	umhos/cm	CJ52618
Field Dissolved Oxygen	**6.59** (N/A)		Field	1	1	MNM	09/25/15 8:00	mg/L	CJ51545
Field pH	**7.00** (N/A)		Field		1	MNM	09/25/15 8:00	S.U.	CJ51545
Field Temperature	**31.1** (N/A)		Field		1	MNM	09/25/15 8:00	°C	CJ51545
Salinity	**1.40** (N/A)		Field		1	MNM	09/25/15 8:00	S.U.	CJ51545
Total Organic Carbon	**11** (0.5)		§		1	SUB	10/23/15 16:55	mg/L	CJ52706
Total Residual Chlorine	**0.19** (N/A)		Field	0.05	1	MNM	09/25/15 8:00	mg/L	CJ51545
Total Solids	**H 1710** (10)		2540B		1	EEM	10/26/15 16:55	mg/L	CJ52621
Total Suspended Solids	**H** ND (5)		2540D		1	EEM	10/23/15 11:20	mg/L	CJ52226

CERTIFICATE OF ANALYSIS

Client Name: Veolia
Client Project ID: NPDES Bioassay
Client Sample ID: Effluent Start
Date Sampled: 09/21/15 08:00

ESS Laboratory Work Order: 1509567
ESS Laboratory Sample ID: 1509567-07
Sample Matrix: Aqueous

All methods used are in accordance with 40 CFR 136.

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	MA - Permit Limit	DF	Analyst	Analyzed	Units	Batch
Bioassay	**See Attached** (N/A)								

CERTIFICATE OF ANALYSIS

Client Name: Veolia
Client Project ID: NPDES Bioassay
Client Sample ID: Receiving Water Start
Date Sampled: 09/23/15 13:00

ESS Laboratory Work Order: 1509567
ESS Laboratory Sample ID: 1509567-08
Sample Matrix: Aqueous

All methods used are in accordance with 40 CFR 136.

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	MA - Permit Limit	DF	Analyst	Analyzed	Units	Batch
Bioassay	**See Attached** (N/A)								

CERTIFICATE OF ANALYSIS

Client Name: Veolia
Client Project ID: NPDES Bioassay
Client Sample ID: Effluent First Renewal
Date Sampled: 09/23/15 08:00

ESS Laboratory Work Order: 1509567
ESS Laboratory Sample ID: 1509567-09
Sample Matrix: Aqueous

All methods used are in accordance with 40 CFR 136.

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	MA - Permit Limit	DF	Analyst	Analyzed	Units	Batch
Bioassay	**See Attached** (N/A)								

CERTIFICATE OF ANALYSIS

Client Name: Veolia
Client Project ID: NPDES Bioassay
Client Sample ID: Receiving Water First Renewal
Date Sampled: 09/23/15 11:00

ESS Laboratory Work Order: 1509567
ESS Laboratory Sample ID: 1509567-10
Sample Matrix: Aqueous

All methods used are in accordance with 40 CFR 136.

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	MA - Permit Limit	DF	Analyst	Analyzed	Units	Batch
Bioassay	**See Attached** (N/A)								

CERTIFICATE OF ANALYSIS

Client Name: Veolia
Client Project ID: NPDES Bioassay

ESS Laboratory Work Order: 1509567

Quality Control Data

Total Metals

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch CI52327 - 3005A/200.7										
Blank										
Cadmium	ND	0.0025	mg/L							
Chromium	ND	0.010	mg/L							
Copper	ND	0.005	mg/L							
Lead	ND	0.010	mg/L							
Nickel	ND	0.025	mg/L							
Zinc	ND	0.025	mg/L							
Blank										
Aluminum	ND	0.020	mg/L							
Cadmium	ND	0.0010	mg/L							
Calcium	ND	0.040	mg/L							
Calcium	ND	0.040	mg/L							
Chromium	ND	0.004	mg/L							
Copper	ND	0.002	mg/L							
Hardness	ND	0.265	mg/L							
Lead	ND	0.004	mg/L							
Magnesium	ND	0.040	mg/L							
Magnesium	ND	0.040	mg/L							
Nickel	ND	0.010	mg/L							
Zinc	ND	0.010	mg/L							
Blank										
Aluminum	ND	0.100	mg/L							
Cadmium	ND	0.0050	mg/L							
Chromium	ND	0.020	mg/L							
Copper	ND	0.010	mg/L							
Lead	ND	0.020	mg/L							
Magnesium	ND	0.200	mg/L							
Nickel	ND	0.050	mg/L							
Zinc	ND	0.050	mg/L							
LCS										
Cadmium	0.120	0.0025	mg/L	0.1250		96	85-115			
Chromium	0.245	0.010	mg/L	0.2500		98	85-115			
Copper	0.244	0.005	mg/L	0.2500		98	85-115			
Lead	0.255	0.010	mg/L	0.2500		102	85-115			
Nickel	0.246	0.025	mg/L	0.2500		98	85-115			
Zinc	0.251	0.025	mg/L	0.2500		100	85-115			
LCS										
Aluminum	0.487	0.020	mg/L	0.5000		97	85-115			
Cadmium	0.0479	0.0010	mg/L	0.05000		96	85-115			
Calcium	0.989	0.040	mg/L	1.000		99	85-115			
Calcium	0.989	0.040	mg/L	1.000		99	85-115			
Chromium	0.099	0.004	mg/L	0.1000		99	85-115			
Copper	0.102	0.002	mg/L	0.1000		102	85-115			
Hardness	6.53	0.265	mg/L							

CERTIFICATE OF ANALYSIS

Client Name: Veolia
Client Project ID: NPDES Bioassay

ESS Laboratory Work Order: 1509567

Quality Control Data

Total Metals

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch CI52327 - 3005A/200.7										
Lead	0.101	0.004	mg/L	0.1000		101	85-115			
Magnesium	0.985	0.040	mg/L	1.000		99	85-115			
Magnesium	0.985	0.040	mg/L	1.000		99	85-115			
Nickel	0.099	0.010	mg/L	0.1000		99	85-115			
Zinc	0.101	0.010	mg/L	0.1000		101	85-115			
LCS										
Aluminum	2.49	0.100	mg/L	2.500		100	85-115			
Cadmium	0.236	0.0050	mg/L	0.2500		94	85-115			
Chromium	0.504	0.020	mg/L	0.5000		101	85-115			
Copper	0.495	0.010	mg/L	0.5000		99	85-115			
Lead	0.507	0.020	mg/L	0.5000		101	85-115			
Magnesium	4.90	0.200	mg/L	5.000		98	85-115			
Nickel	0.500	0.050	mg/L	0.5000		100	85-115			
Zinc	0.497	0.050	mg/L	0.5000		99	85-115			
LCS Dup										
Cadmium	0.119	0.0025	mg/L	0.1250		96	85-115	0.2	20	
Chromium	0.252	0.010	mg/L	0.2500		101	85-115	3	20	
Copper	0.248	0.005	mg/L	0.2500		99	85-115	2	20	
Lead	0.253	0.010	mg/L	0.2500		101	85-115	0.9	20	
Nickel	0.250	0.025	mg/L	0.2500		100	85-115	2	20	
Zinc	0.255	0.025	mg/L	0.2500		102	85-115	2	20	
LCS Dup										
Aluminum	0.464	0.020	mg/L	0.5000		93	85-115	5	20	
Cadmium	0.0455	0.0010	mg/L	0.05000		91	85-115	5	20	
Calcium	0.931	0.040	mg/L	1.000		93	85-115	6	20	
Calcium	0.931	0.040	mg/L	1.000		93	85-115	6	20	
Chromium	0.094	0.004	mg/L	0.1000		94	85-115	6	20	
Copper	0.096	0.002	mg/L	0.1000		96	85-115	5	20	
Hardness	6.20	0.265	mg/L							
Lead	0.095	0.004	mg/L	0.1000		95	85-115	6	20	
Magnesium	0.942	0.040	mg/L	1.000		94	85-115	5	20	
Magnesium	0.942	0.040	mg/L	1.000		94	85-115	5	20	
Nickel	0.093	0.010	mg/L	0.1000		93	85-115	6	20	
Zinc	0.097	0.010	mg/L	0.1000		97	85-115	4	20	
LCS Dup										
Aluminum	2.48	0.100	mg/L	2.500		99	85-115	0.5	20	
Cadmium	0.239	0.0050	mg/L	0.2500		96	85-115	1	20	
Chromium	0.503	0.020	mg/L	0.5000		101	85-115	0.3	20	
Copper	0.494	0.010	mg/L	0.5000		99	85-115	0.2	20	
Lead	0.516	0.020	mg/L	0.5000		103	85-115	2	20	
Magnesium	4.89	0.200	mg/L	5.000		98	85-115	0.2	20	
Nickel	0.502	0.050	mg/L	0.5000		100	85-115	0.3	20	
Zinc	0.501	0.050	mg/L	0.5000		100	85-115	0.8	20	
Batch CJ52267 - 3005A/200.7										

CERTIFICATE OF ANALYSIS

Client Name: Veolia
Client Project ID: NPDES Bioassay

ESS Laboratory Work Order: 1509567

Quality Control Data

Total Metals

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch CJ52267 - 3005A/200.7										
Blank										
Aluminum	ND	0.020	mg/L							
Cadmium	ND	0.0010	mg/L							
Calcium	ND	0.040	mg/L							
Calcium	ND	0.040	mg/L							
Chromium	ND	0.004	mg/L							
Copper	ND	0.002	mg/L							
Hardness	ND	0.265	mg/L							
Lead	ND	0.004	mg/L							
Magnesium	ND	0.040	mg/L							
Magnesium	ND	0.040	mg/L							
Nickel	ND	0.010	mg/L							
Zinc	ND	0.010	mg/L							
Blank										
Cadmium	ND	0.0050	mg/L							
Chromium	ND	0.010	mg/L							
Copper	ND	0.010	mg/L							
Lead	ND	0.010	mg/L							
Nickel	ND	0.025	mg/L							
Zinc	ND	0.025	mg/L							
LCS										
Aluminum	0.491	0.020	mg/L	0.5000		98	85-115			
Cadmium	0.0476	0.0010	mg/L	0.05000		95	85-115			
Calcium	1.04	0.040	mg/L	1.000		104	85-115			
Calcium	1.04	0.040	mg/L	1.000		104	85-115			
Chromium	0.096	0.004	mg/L	0.1000		96	85-115			
Copper	0.102	0.002	mg/L	0.1000		102	85-115			
Hardness	6.99	0.265	mg/L							
Lead	0.095	0.004	mg/L	0.1000		95	85-115			
Magnesium	1.07	0.040	mg/L	1.000		107	85-115			
Magnesium	1.07	0.040	mg/L	1.000		107	85-115			
Nickel	0.098	0.010	mg/L	0.1000		98	85-115			
Zinc	0.099	0.010	mg/L	0.1000		99	85-115			
LCS										
Cadmium	0.117	0.0050	mg/L	0.1250		93	85-115			
Chromium	0.244	0.010	mg/L	0.2500		97	85-115			
Copper	0.246	0.010	mg/L	0.2500		98	85-115			
Lead	0.242	0.010	mg/L	0.2500		97	85-115			
Nickel	0.244	0.025	mg/L	0.2500		97	85-115			
Zinc	0.238	0.025	mg/L	0.2500		95	85-115			
LCS Dup										
Aluminum	0.478	0.020	mg/L	0.5000		96	85-115	3	20	
Cadmium	0.0459	0.0010	mg/L	0.05000		92	85-115	4	20	
Calcium	0.999	0.040	mg/L	1.000		100	85-115	4	20	

CERTIFICATE OF ANALYSIS

Client Name: Veolia
Client Project ID: NPDES Bioassay

ESS Laboratory Work Order: 1509567

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Metals										
Batch CJ52267 - 3005A/200.7										
Calcium	0.999	0.040	mg/L	1.000		100	85-115	4	20	
Chromium	0.093	0.004	mg/L	0.1000		93	85-115	3	20	
Copper	0.099	0.002	mg/L	0.1000		99	85-115	3	20	
Hardness	6.73	0.265	mg/L							
Lead	0.090	0.004	mg/L	0.1000		90	85-115	5	20	
Magnesium	1.03	0.040	mg/L	1.000		103	85-115	4	20	
Magnesium	1.03	0.040	mg/L	1.000		103	85-115	4	20	
Nickel	0.095	0.010	mg/L	0.1000		95	85-115	3	20	
Zinc	0.097	0.010	mg/L	0.1000		97	85-115	2	20	
LCS Dup										
Cadmium	0.122	0.0050	mg/L	0.1250		97	85-115	4	20	
Chromium	0.255	0.010	mg/L	0.2500		102	85-115	5	20	
Copper	0.258	0.010	mg/L	0.2500		103	85-115	5	20	
Lead	0.254	0.010	mg/L	0.2500		102	85-115	5	20	
Nickel	0.255	0.025	mg/L	0.2500		102	85-115	5	20	
Zinc	0.250	0.025	mg/L	0.2500		100	85-115	5	20	
Classical Chemistry										
Batch CI52403 - NH4 Prep										
Blank										
Ammonia as N	ND	0.10	mg/L							
LCS										
Ammonia as N	0.12	0.10	mg/L	0.09994		119	80-120			
LCS										
Ammonia as N	1.17	0.10	mg/L	0.9994		117	80-120			
Batch CI52518 - General Preparation										
Blank										
Total Solids	ND	10	mg/L							
LCS										
Total Solids	330		mg/L	324.0		102	80-120			
Batch CI52519 - General Preparation										
Blank										
Total Suspended Solids	ND	5	mg/L							
LCS										
Total Suspended Solids	42		mg/L	42.10		100	80-120			
Batch CI52524 - General Preparation										
Blank										
Conductivity	ND	5	umhos/cm							
LCS										
Conductivity	1400		umhos/cm	1411		99	90-110			
Batch CI52539 - General Preparation										

CERTIFICATE OF ANALYSIS

Client Name: Veolia
Client Project ID: NPDES Bioassay

ESS Laboratory Work Order: 1509567

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Classical Chemistry										
Batch CI52539 - General Preparation										
Blank										
Alkalinity as CaCO3	ND	10	mg/L							
LCS										
Alkalinity as CaCO3	73		mg/L	78.30		93	85-115			
Batch CJ52226 - General Preparation										
Blank										
Total Suspended Solids	ND	5	mg/L							
LCS										
Total Suspended Solids	40		mg/L	42.10		95	80-120			
Batch CJ52304 - NH4 Prep										
Blank										
Ammonia as N	ND	0.10	mg/L							
LCS										
Ammonia as N	0.09	0.10	mg/L	0.09994		92	80-120			
LCS										
Ammonia as N	0.96	0.10	mg/L	0.9994		96	80-120			
Batch CJ52403 - General Preparation										
Blank										
Alkalinity as CaCO3	ND	10	mg/L							
LCS										
Alkalinity as CaCO3	84		mg/L	78.30		107	85-115			
Batch CJ52618 - General Preparation										
Blank										
Conductivity	ND	5	umhos/cm							
LCS										
Conductivity	1390		umhos/cm	1411		98	90-110			
Batch CJ52621 - General Preparation										
Blank										
Total Solids	ND	10	mg/L							
LCS										
Total Solids	320		mg/L	324.0		99	80-120			

CERTIFICATE OF ANALYSIS

Client Name: Veolia
Client Project ID: NPDES Bioassay ESS Laboratory Work Order: 1509567

Notes and Definitions

Z-08	See Attached
U	Analyte included in the analysis, but not detected
HT	The maximum holding time listed in 40 CFR Part 136 Table II for pH, Dissolved Oxygen, Sulfite and Residual Chlorine is fifteen minutes.
H	Estimated value. Sample hold times were exceeded (H).
D	Diluted.
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report

CERTIFICATE OF ANALYSIS

Client Name: Veolia
Client Project ID: NPDES Bioassay

ESS Laboratory Work Order: 1509567

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/water/dwp-services/labcert/documents/AllLabs.xls

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
http://www.depweb.state.pa.us/portal/server.pt/community/labs/13780/laboratory_accreditation_program/590095

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61 Louisa Viens Drive
Dayville, CT 06241
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Phone: 860-774-6814
Toll-Free: 800-334-0103

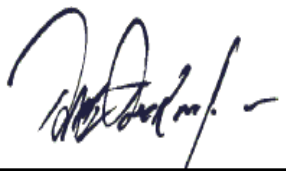
ANALYTICAL DATA REPORT

prepared for:

ESS Laboratory
185 Frances Avenue
Cranston, RI 02910-2211
Liz Ouk

Report Number: E509V80
Revision 1
Project: MA-Groundwater

Received Date: 09/28/2015
Report Date: 09/30/2015
Revision Date: 10/01/2015



David Dickinson
Technical Director

ACCREDITED IN ACCORDANCE WITH nelac

CT DPH #PH-0465 EPA #CT00008 MA DEP #M-CT008 MD #349 ME DHHS #CT0050
NH ELAP #2020 NY ELAP #11549 PA DEP #68-04413 RI DOH #LAO00346 VA #460279 VT DOH #VT11549

101-000000477741

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Toll-Free: 800-334-0103

Report No: E509V80
Client: ESS Laboratory
Project: MA-Groundwater

CASE NARRATIVE / METHOD CONFORMANCE SUMMARY

The results presented in this report relate only to the samples received.

This report is incomplete unless all pages indicated in the pagination at the bottom of the page are included, along with a copy of the chain of custody and any subcontracted analyses reports, if applicable, for the sample(s) in this report. Subcontractor results are identified by 'SUB' next to the analysis.

Microbac Laboratories, Inc. received two samples from ESS Laboratory on 09/28/2015. The samples were analyzed for the following list of analyses in accordance with MA DEP regulations unless otherwise indicated:

Total Organic Carbon (TOC) by SM5310C
SM 5310C

Non-Conformances:

Work Order:

None

Sample:

None

Analysis:

None

Microbac Laboratories, Inc.
Analytical Data Report

Report No: E509V80
Date Received: 09/28/2015 15:30

Customer: ESS Laboratory
Project: MA-Groundwater

Parameter	Result	DL	Units	Completed	By	Dilution
(1) 1509567-1						
Date Collected: 09/21/2015 13:00 **Matrix: Aqueous**						
Total Organic Carbon (TOC) by SM5310C	9.3	0.50	mg/L	09/29/2015 18:55	M_B	
(2) 1509567-2						
Date Collected: 09/21/2015 08:00 **Matrix: Aqueous**						
Total Organic Carbon (TOC) by SM5310C	12	0.50	mg/L	09/29/2015 19:11	M_B	
(3) Method Blank						
Date Collected: 09/28/2015 **Matrix: Aqueous**						
Total Organic Carbon (TOC) by SM5310C	ND	0.50	mg/L	09/29/2015 18:39	M_B	

Wet Chemistry Duplicate/Matrix Spike Summary

E509V80

								LCS			
Sample	**Sample**	**Sample Duplicate**	**RPD**	**Spike Amount**	**LFM Result**	**% Recovery**	**Recovery Limits**	**Result**	**% Recovery**	**Recovery Limits**	**Analysis Date**
TOC											
ICV				***12***				12.6	105	***90-110***	
E509V17-1	1.39			***5.0***	6.46	101	***80-120***				9/29/2015
E509V14-1	7.73	7.46	3.6				***25***				

When the sample or duplicate concentration is < 5X the DL, the control limit becomes +/- the DL.
When the sample concentration is > 4 X the spiked concentration there is no QC action limit.

E509V80

ESS Laboratory — Premier/ Microbac — CHAIN OF CUSTODY

ESS Lab # 1509567

Division of Thielsch Engineering, Inc.
185 Frances Avenue, Cranston RI 02910-2211
Tel. (401)461-7181 Fax (401)461-4486
www.esslaboratory.com

Turn Time ✓ Standard ~~Other~~ 2-3 DAY W 9/28

Regulatory State: **MA** RI CT NH NJ NY ME Other_____

Is this project for any of the following:(please circle)
MA-MCP Navy USACE CT DEP Other_____

Reporting Limits - _____

Electonic Deliverables **Excel*** Access PDF

Co. Name	Project #	Project Name
ESS Laboratory		1509567

Contact Person	Proj. Location
Shawn Morrell	

Address	City , State	Zip	PO #
			B02199

Tel.	email:	email:
Ext 3083	smorrell@thielsch.com	

ESS Lab ID	Date	Collection Time	Grab -G Composite-C	Matrix	Sample ID	Pres Code	# of Containers	Type of Container	Vol of Container	Analysis: TOC	Analysis: DOC W 9/28/15
	9/21/15	1300	G	SW	1509567-1	3	2	V	40mL	X	
	9/20 – 9/21/15	0800 – 0800	C	WW	1509567-2	3	2	V	40mL	X	

Container Type: P-Poly G-Glass AG-Amber Glass S-Sterile V-VOA

Matrix: S-Soil SD-Solid D-Sludge WW-Wastewater GW-Groundwater SW-Surface Water DW-Drinking Water O-Oil W-Wipes F-Filter

Cooler Present _____Yes _____No

Seals Intact ____ Yes _____No NA:____

Cooler Temperature: _____

Internal Use Only

[ ] Pickup

[ ] Technician____

Preservation Code: 1-NP, 2-HCl, 3-H2SO4, 4-HNO3, 5-NaOH, 6-MeOH, 7-Asorbic Acid, 8-ZnAct, 9-_____

Sampled by :

Comments: ***Please Provide ESS Deliverables**

Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)	Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)
9/28/15 1031	Mally Raund 9/28/15 1031		
Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)	Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)
		Mally Raund 9/28/15 15:30	Michael Noble 9/28/15 1530

* By circling MA-MCP, client acknowledges sampels were collected in accordance with MADEP CAM VIIA

Please fax to the laboratory all changes to Chain of Custody

Report Method Blank & Laboratory Control Sample Results

4.5 °C

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ANALYTICAL DATA REPORT

prepared for:

ESS Laboratory
185 Frances Avenue
Cranston, RI 02910-2211
Shawn Morrell

Report Number: E510O33
Project: MA-Groundwater

Received Date: 10/23/2015
Report Date: 10/26/2015

David Dickinson
Technical Director

ACCREDITED IN ACCORDANCE WITH nelac

CT DPH #PH-0465 EPA #CT00008 MA DEP #M-CT008 MD #349 ME DHHS #CT0050
NH ELAP #2020 NY ELAP #11549 PA DEP #68-04413 RI DOH #LAO00346 VA #460279 VT DOH #VT11549

101-0000000481088

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Report No: E510O33
Client: ESS Laboratory
Project: MA-Groundwater

CASE NARRATIVE / METHOD CONFORMANCE SUMMARY

The results presented in this report relate only to the samples received.

This report is incomplete unless all pages indicated in the pagination at the bottom of the page are included, along with a copy of the chain of custody and any subcontracted analyses reports, if applicable, for the sample(s) in this report. Subcontractor results are identified by 'SUB' next to the analysis.

Microbac Laboratories, Inc. received four samples from ESS Laboratory on 10/23/2015. The samples were analyzed for the following list of analyses in accordance with MA DEP regulations unless otherwise indicated:

Total Organic Carbon (TOC) by SM5310C
SM 5310C

Non-Conformances:

Work Order:

None

Sample:

None

Analysis:

None

Microbac Laboratories, Inc.
Analytical Data Report

Report No: E510O33
Date Received: 10/23/2015 13:45

Customer: ESS Laboratory
Project: MA-Groundwater

Parameter	Result	DL	Units	Completed	By	Dilution
(1) 15109567-03						
Date Collected: 09/23/2015 11:00 **Matrix: Aqueous**						
Total Organic Carbon (TOC) by SM5310C	9.9	0.50	mg/L	10/23/2015 16:09	M_B	
(2) 15109567-04						
Date Collected: 09/23/2015 08:00 **Matrix: Aqueous**						
Total Organic Carbon (TOC) by SM5310C	11	0.50	mg/L	10/23/2015 16:25	M_B	
(3) 15109567-05						
Date Collected: 09/25/2015 08:55 **Matrix: Aqueous**						
Total Organic Carbon (TOC) by SM5310C	8.9	0.50	mg/L	10/23/2015 16:40	M_B	
(4) 15109567-06						
Date Collected: 09/25/2015 08:00 **Matrix: Aqueous**						
Total Organic Carbon (TOC) by SM5310C	11	0.50	mg/L	10/23/2015 16:55	M_B	
(5) Method Blank						
Date Collected: 10/23/2015 **Matrix: Aqueous**						
Total Organic Carbon (TOC) by SM5310C	ND	0.50	mg/L	10/23/2015 14:59	M_B	

Wet Chemistry Duplicate/Matrix Spike Summary

E510O33

								LCS			
Sample	**Sample**	**Sample Duplicate**	**RPD**	**Spike Amount**	**LFM Result**	**% Recovery**	**Recovery Limits**	**Result**	**% Recovery**	**Recovery Limits**	**Analysis Date**
TOC											
ICV				***12***				12.3	102	***90-110***	
E510J07-2	3.55			***5.0***	8.27	94.4	***80-120***				10/23/2015
E510J07-1	6.09	6.03	1.0				***25***				

When the sample or duplicate concentration is < 5X the DL, the control limit becomes +/- the DL.
When the sample concentration is > 4 X the spiked concentration there is no QC action limit.

E510033

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1509567

Division of Thielsch Engineering, Inc.
185 Frances Avenue,Cranston RI 02910-2211
Tel. (401)461-7181 Fax (401)461-4486
www.esslaboratory.com

Turn Time 1 Day Other_____

Regulatory State: **MA** RI CT NH NJ NY ME Other_____

Is this project for any of the following:(please circle)
MA-MCP Navy USACE CT DEP Other_____

Reporting Limits - _____

Electonic Deliverables **Excel*** Access PDF

Co. Name: **ESS Laboratory**	Project #:	Project Name: **1509567**	
Contact Person: **Shawn Morrell**	Proj. Location:		
Address:	City , State:	Zip:	PO #: B02199
Tel.: Ext 3083	email: smorrell@thielsch.com	email:	

ESS Lab ID	Date	Collection Time	Grab -G Composite-C	Matrix	Sample ID	Pres Code	# of Containers	Type of Container	Vol of Container	Analysis: TOC	Analysis: DOC						
	09/23/15	1100	G	SW	1509567-03	3	2	V	40 mL	X							
	09/22-15-0923-15	0800-0800	C	SW	1509567-04	3	2	V	40 mL	X							
	09/25/15	0855	G	SW	1509567-05	3	2	V	40 mL	X							
	09/24/15-09/25/15	0800-0800	C	SW	1509567-06	3	2	V	40 mL	X							

Container Type: P-Poly G-Glass AG-Amber Glass S-Sterile V-VOA

Matrix: S-Soil SD-Solid D-Sludge WW-Wastewater GW-Groundwater SW-Surface Water DW-Drinking Water O-Oil W-Wipes F-Filter

Cooler Present _____Yes _____No
Seals Intact ____ Yes _____No NA:____
Cooler Temperature: _____

Internal Use Only
[ ] Pickup
[ ] Technician____

Preservation Code: 1-NP, 2-HCl, 3-H2SO4, 4-HNO3, 5-NaOH, 6-MeOH, 7-Asorbic Acid, 8-ZnAct, 9-_____

Sampled by :

Comments: ***Please Provide ESS Deliverables**

Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)	Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)
10/23/15 1227	10-23-15 1227	10-23-15 1345	10/23/15 1345
Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)	Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)

* By circling MA-MCP, client acknowledges sampels were collected in accordance with MADEP CAM VIIA

Please fax to the laboratory all changes to Chain of Custody

Report Method Blank & Laboratory Control Sample Results 2.1

ESI

EnviroSystems, Inc.
P.O. Box 778
Hampton, NH 03843-0778
603-926-3345

October 22, 2015

Mr. Joe Sirbak
ESS Laboratories
185 Frances Avenue
Cranston, Rhode Island 02910

Dear Mr. Sirbak:

Enclosed, please find a copy of our report evaluating the toxicity of effluent samples collected from the Kendall Green Energy Facility located in Cambridge, Massachusetts during September and October 2015. Chronic toxicity was evaluated using the inland silverside minnow, *Menidia beryllina*, and the purple sea urchin, *Arbacia punctulata*.

Please note that the *A. punctulata* assay started on September 24, 2015 failed to meet the test acceptability criterion for fertilization in the receiving water diluent and all test concentrations. The assay was successfully repeated starting October 16, 2015. Bench sheets and data from the original non-compliant assay can be found in the data appendix.

Please do not hesitate to call me or Petra Karbe should you have any questions regarding the report.

Sincerely,

EnviroSystems, Incorporated

Kirk Cram
NPDES Laboratory Manager

Enclosure
WET Test Report Certification
WET Test Report Number 26494 / 26633-15-09
One (1) Copy (email only)

cc: Mr. Matt Miller (email only)
Ms. Michelle Mirenda (email only)
Mr. Shawn Morrell (email only)

WHOLE EFFLUENT TOXICITY TEST REPORT CERTIFICATION

Permittee Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Executed on: 11/30/15

Authorized Signature

R. Scott McBurney

Print or Type Name

Kendall Green Energy, LLC

Print or Type the Permittee's Name

MA0004898

Type or Print the NPDES Permit No.

WHOLE EFFLUENT TOXICITY TEST REPORT CERTIFICATION (Bioassay Laboratory)

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Executed on: October 22, 2015

Kirk Cram
NPDES Laboratory Manager - EnviroSystems, Inc.

TOXICOLOGICAL EVALUATION
OF A POWER PLANT EFFLUENT
BIOMONITORING SUPPORT FOR A NPDES PERMIT:
September and October 2015

Kendall Green Energy Facility
Cambridge, Massachusetts
NPDES Permit Number MA0004898

Prepared For:

ESS Laboratories
185 Frances Avenue
Cranston, Rhode Island 02910

Prepared By:

EnviroSystems, Incorporated
One Lafayette Road
Hampton, New Hampshire 03842

September and October 2015
Reference Number: ESS-Kendall26494&26633-15-09

STUDY NUMBER 26494 / 26633

EXECUTIVE SUMMARY

The following summarizes the results of modified acute and chronic exposure bioassays performed during September and October 2015 to support the NPDES biomonitoring requirements of the Kendall Green Energy Facility located in Cambridge, Massachusetts. Samples were provided by ESS Laboratories, Cranston, Rhode Island. Acute and chronic toxicity was evaluated using the salt water species, *Menidia beryllina* and *Arbacia punctulata*.

M. beryllina were 10 days old at the start of the test. *A. punctulata* were from cultures maintained by ESI. Original stock was obtained from commercial supply. Dilution water for the *M. beryllina* assay was receiving water collected from the Charles River upstream of the discharge. Dilution water for the *A. punctulata* assay was 30 ppt laboratory seawater collected from the Hampton/Seabrook Estuary. This water is classified as SA-1 and has been used to culture marine test organisms since 1981. Samples were received under chain of custody in good order. All sample receipt, test conditions and control endpoints were within protocol specifications, except where otherwise noted.

The results presented in this report relate only to the samples described on the chain(s) of custody and sample receipt log(s), and are intended to be used only by the submitter. Results from the chronic and modified acute exposure assays and their relationship to permit limits are summarized in the following matrix.

Acute Toxicity Evaluation

Species	Exposure	LC-50	A-NOEC	Permit Limit (LC-50)	Effluent Meets Permit Limit	Assay Meets Protocol Limits
Menidia beryllina	48 Hours	>100%	NC	Report	NA	Yes

Chronic Toxicity Evaluation

Species	Exposure	C-NOEC	IC-25	Permit Limit (C-NOEC)	Effluent Meets Permit Limit	Assay Meets Protocol Limits
Menidia beryllina	7 Days	100%	>100%	Report	NA	Yes [a]
Arbacia punctulata	60 Minutes	50% [b]	55.1%	Report	NA	Yes

COMMENTS:
NA = Not Applicable.
NC = Not Calculated.
[a] The minnow assay failed to meet the protocol specified statistical variability limit, expressed as MSDp, for growth (dry biomass). The MSDp was computed to be 32.9%, which exceeds the acceptable range of 11% - 28 % recommended by the method protocol but falls within ±2 standard deviations of EnviroSystem's historic mean for minnow growth (8.6% - 43.7%). Calculation of the IC-25 for biomass resulted in a value of >100%, which supports the calculated C-NOEC. Based on these findings these data are considered provisionally valid and a C-NOEC of 100% is considered representative of the data.
[b] The statistical analysis for *A. punctulata* fertilization resulted in a non-standard dose response, determining that the 25% and 100% test concentrations were significantly less than the diluent control and resulting in a calculated C-NOEC of 12.5%. All test acceptability criteria were met and the IC-25 calculated for fertilization was 55.1%. According to US EPA Region I policy, fertilization is not considered to be significantly reduced if >70% (US EPA, 2013) and fertilization was above 70% in all but the 100% test concentration. Based on this weight of evidence, the C-NOEC is 50%.

TOXICOLOGICAL EVALUATION
OF A POWER PLANT EFFLUENT
BIOMONITORING SUPPORT FOR A NPDES PERMIT:
September and October 2015

Kendall Green Energy Facility
Cambridge, Massachusetts
NPDES Permit Number MA0004898

1.0 INTRODUCTION

This report presents the results of toxicity tests completed on a series of composite effluent samples collected from the Kendall Green Energy Facility located in Cambridge, Massachusetts. Samples were provided by ESS Laboratories, Cranston, Rhode Island. Testing was based on programs and protocols developed by the US EPA (2002), with exceptions as noted by US EPA Region I (2012; 2013). A 7 day chronic and modified acute toxicity test was conducted with the inland silverside minnow, *M. beryllina*, and a 60 minute chronic fertilization assay was conducted with the purple sea urchin, *A. punctulata*. Testing was performed at EnviroSystems, Incorporated (ESI), Hampton, New Hampshire in accordance with the provisions of TNI Standards (2009).

Acute toxicity tests involve preparing a series of test concentrations by diluting effluent with control water. Groups of test organisms are exposed to each effluent concentration and a control for a specified period. In acute tests, mortality data for each concentration are used to calculate (by regression) the median lethal concentration or LC-50, defined as the effluent concentration that kills half of the test organisms. Samples with high LC-50 values are less likely to cause significant environmental impacts. The no-effect concentration is also determined to provide information about the level of effluent that would have minimal acute effects in the environment. Chronic tests evaluate toxicity based on sublethal effects. Fertilization of *Arbacia punctulata* eggs or growth (weight) of *Menidia beryllina* are measured to determine effluent concentrations that have a significant impact on the organisms. Using Analysis of Variance techniques to evaluate the data, it is possible to determine the lowest concentration that had an effect (C-LOEC) and the highest concentration where no effect was observed (C-NOEC). *A. punctulata* fertilization data are also evaluated to determine the effluent concentration where a reduction in fertilization rates occurs. This is known as the Inhibition Concentration (IC).

2.0 MATERIALS AND METHODS

2.1 General Methods

Toxicological and analytical protocols used in this program follow procedures primarily designed to provide standard approaches for the evaluation of toxicological effects of discharges on aquatic organisms (US EPA 2002) and for the analysis of water samples (APHA 2012). See Section 4.0 for a list of references.

2.2 Test Species

When necessary, *M. beryllina* were acclimated to approximate test conditions prior to use in the assay. Test organisms were transferred to test chambers using an inverted glass pipet, minimizing the amount of water added to test solutions. Male and female *A. punctulata* are maintained in separate chambers as recommended by protocol (US EPA 2002).

2.3 Effluent, Receiving Water and Laboratory Water

Effluent and receiving water collection information is provided in Table 1.Samples were received at 0-6°C as per 40 CFR §136.3 unless otherwise noted, stored at 4±2°C, and warmed to 25±1°C prior to preparing test solutions for the *M. beryllina* assay and 20±1°C for the *A. punctulata* assay. Effluent used in the *M. beryllina* assays was salinity adjusted to 25±2 ppt and the effluent used in the *A. punctulata* assay was salinity adjusted to 30±2 ppt using artificial sea salts according to protocol (US EPA 2002). Laboratory water was collected from the Hampton/Seabrook Estuary. This water is classified as SA-1 and has been used to culture marine test organisms since 1981.

Total residual chlorine (TRC) was measured by amperometric titration (MDL 0.02 mg/L) in effluent and diluent samples. Samples containing ≥0.02 mg/L TRC are treated with sodium thiosulfate (US EPA 2002).

2.4 Bioassays

Test concentrations for both assays were 100% (undiluted), 50%, 25%,12.5%, and 6.25% effluent.

2.4.1 *Menidia beryllina* Chronic Exposure Bioassay

The 7 day static renewal chronic exposure assay was conducted at 25±1°C with a photoperiod of 16:8 hours light:dark. Fish were maintained in 600 mL beakers containing 500 mL of test solution in each of 4 replicates containing 10 organisms/replicate. Replicates were not randomized during testing; rather, organisms were added randomly at test initiation by replicate across test solutions in an alternating fashion (alternating allocation). Newly collected effluent samples were used on days 2 and 4 of the test.

Prior to daily renewals, survival and dissolved oxygen were recorded in all replicates. Salinity, pH, and temperature were measured in one replicate of each new test treatment. Survival data were analyzed to assess acute toxicity after the initial 48 hours of exposure.

During the test, fish were fed ≤24 hour old *Artemia* nauplii. On Day 7 of the assay, surviving fish were tranquilized using Finquel® tricaine methanesulfonate, removed from test solutions, and rinsed to remove any surface detritus and salts. Fish were placed on tared containers and dried overnight at 104±5°C in order to obtain dry weight to the nearest 0.01 mg. To obtain dry biomass/fish for statistical comparisons, the net dry weight was divided by the number of organisms added at the start of the assay.

2.4.2 *Arbacia punctulata* Chronic Fertilization Bioassay

Test chambers were 20 mL plastic vials with 5 mL of test solution in each of 4 replicates. Replicates were not randomized during testing; rather, organisms were added randomly at test initiation by replicate across test solutions in an alternating fashion (alternating allocation). Gametes were obtained by potassium chloride injection to induce spawning. Sperm were collected, diluted to specified concentration (see data appendix for concentration), and exposed to effluent solutions for 60 minutes. Eggs were introduced to sperm/effluent solutions and exposed for 20 minutes prior to the addition of preservative. Aliquots of preserved solution were counted to determine fertilized and unfertilized eggs.

2.5 Data Analysis

Statistical analysis of acute and chronic exposure data was completed using CETIS™ v1.8.6.6 and 1.9.0.9, Comprehensive Environmental Toxicity Information System, software. The program computes acute and chronic exposure endpoints based on US EPA decision tree guidelines specified in individual test methods. If survival in the highest test concentration is >50%, the LC-50 is obtained by direct observation of the raw data. As needed, the A-NOEC is determined as the highest test concentration that caused no significant mortality. For chronic exposure endpoints statistical significance was accepted at $\propto = 0.05$.

2.6 Quality Control

As part of the laboratory quality control program, standard reference toxicant assays are completed on a regular basis for each test species. These results, presented in Table 2, provide relative health and response data while allowing for comparison with historic data sets.

3.0 RESULTS AND DISCUSSION

Results of the modified acute and chronic exposure assays using *M. beryllina* are provided in Table 3. Data from the *A. punctulata* fertilization assay are summarized in Table 4. Effluent and diluent water quality data and chemistry support data are presented in Tables 5 and 6. US EPA Attachment F toxicity test summary forms are provided after the tables. Support data, including copies of laboratory bench sheets are in Appendix A.

3.1 *Menidia beryllina* Chronic Exposure Bioassay

Minimum test acceptability criteria require 80% control survival, a mean dry weight of 0.5 mg/fish based on Day 7 survival, and the MSDp for biomass to be <28% for *Menidia beryllina* (US EPA 2002). Achievement of these results indicates that healthy test organisms were used and that the dilution water had no significant adverse impact on the outcome of the assay. See the Executive Summary and Table 3 for test acceptability.

3.2 *Arbacia punctulata* Chronic Fertilization Bioassay

Protocol specifies a ≥70% fertilization rate and the MSDp for fertilization to be <25% for *Arbacia punculata* (US EPA 2002). Achievement of these results indicates that healthy test organisms were used and that the dilution water had no significant adverse impact on the outcome of the assay. See the Executive Summary and Table 4 for test acceptability.

4.0 LITERATURE CITED

40 CFR §136.3. *Code of Federal Regulations* (CFR), Protection of the Environment (Title 40), Guidelines Establishing Test Procedures for the Analysis of Pollutants (Part 136), Identification of Test Procedures (sub-part 3), Table II-Required Containers, Preservation Techniques, and Holding Times.

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US EPA Region I. 2012. *Marine Acute Toxicity Test Procedure and Protocol*. US EPA Region I Office, Boston, Massachusetts. July 2012.

US EPA Region I. 2013. *Marine Chronic Toxicity Test Procedure and Protocol*. US EPA Region I Office, Boston, Massachusetts. November 2013.

TABLE 1. Summary of Sample Collection Information.
Kendall Green Energy Biomonitoring Evaluation. September and October 2015.

Sample Description	Type	Collection Date	Collection Time	Receipt Date	Receipt Time	Arrival Temp °C
M. beryllina assay						
EFFLUENT						
Start	Comp	09/20-21/15	0800-0800	09/21/15	1455	4
1st Renewal	Comp	09/22-23/15	0800-0800	09/23/15	1340	1
2nd Renewal	Comp	09/24-25/15	0800-0800	09/25/15	1105	1
RECEIVING WATER						
Start	Grab	09/21/15	1300	09/21/15	1455	4
1st Renewal	Grab	09/23/15	1100	09/23/15	1340	1
2nd Renewal	Grab	09/25/15	0855	09/25/15	1105	1
A. punctulata assay						
EFFLUENT						
Start	Comp	10/15-16/15	1145-1145	10/16/15	1315	2
RECEIVING WATER						
Start	Grab	10/16/15	1130	10/16/15	1315	2

TABLE 2. Summary of Reference Toxicant Data.
Kendall Green Energy Biomonitoring Evaluation. September 2015.

Date	Endpoint		Value	Historic Mean/ Central Tendency	Acceptable Range	Reference Toxicant
M. beryllina						
09/29/15	Survival	48Hr LC-50	6.4	6.3	4.1 - 8.5	SDS (mg/L)
09/29/15	Survival	C-NOEC	2.5	5.0	2.5 - 10.0	SDS (mg/L)
09/29/15	Growth	C-NOEC	2.5	5.0	2.5 - 10.0	SDS (mg/L)
09/29/15	Growth	MSDp	24.0	26.2	8.6 - 43.7	SDS (mg/L)
A. punctulata						
09/24/15	Fertilization	C-NOEC	5.0	10.0	5.0 - 40.0	Copper (µg/L)
09/24/15	Fertilization	IC-25	10.9	41.1	0 - 90.5	Copper (µg/L)
09/24/15	Fertilization	MSDp	11.1	8.5	0 - 18.4	Copper (µg/L)

Means and Acceptable Ranges based on the most recent 20 reference toxicant assays

TABLE 3. *M. beryllina* **Chronic and Modified Acute Exposure Assay Data Summary. Kendall Green Energy Biomonitoring Evaluation. September 2015.**

Effluent Conc.	Mean Percent Survival		Mean Biomass	Is There a Significant Difference Based on	
	Day 2	Day 7	(mg/fish)	Survival (%)	Growth (Biomass)
LAB	100.0%	100.0%	0.914	-	-
RW	100.0%	100.0%	0.846	-	-
6.25%	100.0%	100.0%	0.865	No	No
12.5%	97.5%	97.5%	0.890	No	No
25.0%	100.0%	97.5%	0.857	No	No
50.0%	100.0%	100.0%	0.948	No	No
100.0%	97.5%	95.0%	1.040	No	No
	LC-50 = >100%		MSDp = 32.9% [a]	NOEC = 100%	NOEC = 100% IC-25 = >100%

COMMENTS:
RW = Receiving water; used as the diluent.
[a] The minnow assay failed to meet the protocol specified statistical variability limit, expressed as MSDp, for growth (dry biomass). The MSDp was computed to be 32.9%, which exceeds the acceptable range of 11% - 28 % recommended by the method protocol but falls within ±2 standard deviations of EnviroSystem's historic mean for minnow growth (8.6% - 43.7%). Calculation of the IC-25 for biomass resulted in a value of >100%, which supports the calculated C-NOEC. Based on these findings these data are considered provisionally valid and a C-NOEC of 100% is considered representative of the data.

TABLE 4. *A. punctulata* **Chronic Exposure Assay Data Summary. Kendall Green Energy Biomonitoring Evaluation. October 2015.**

	TREATMENTS						
	Lab	RW	6.25%	12.5%	25%	50%	100%
Mean % Fertilization	76.6%	81.6%	67.0%	65.0%	60.8%	70.2%	9.0%
Significantly < Diluent	-	-	No	No	Yes [a]	No	Yes [a]

C-NOEC	50.0% [a]
C-LOEC	100.0%
IC-25	55.1%
MSDp	15.1%

COMMENTS
RW = Receiving water; used as a control only.
[a] The statistical analysis for *A. punctulata* fertilization resulted in a non-standard dose response, determining that the 25% and 100% test concentrations were significantly less than the diluent control and resulting in a calculated C-NOEC of 12.5%. All test acceptability criteria were met and the IC-25 calculated for fertilization was 55.1%. According to US EPA Region I policy, fertilization is not considered to be significantly reduced if >70% (US EPA, 2013) and fertilization was above 70% in all but the 100% test concentration. Based on this evidence, the C-NOEC is 50%.

TABLE 5. *M. beryllina* **Initial Water Quality and Analytical Data Summary Kendall Green Energy Biomonitoring Evaluation. September 2015.**

PARAMETER	UNITS	EFFLUENT	RECEIVING WATER
pH - As Received	SU	7.67	8.49
Salinity - As Received	ppt	1	1
TRC	mg/L	<0.02	<0.02

COMMENTS:
Additional water quality data are provided in Appendix A.

TABLE 6. *A. punctulata* **Initial Water Quality and Analytical Data Summary Kendall Green Energy Biomonitoring Evaluation. October 2015.**

PARAMETER	UNITS	EFFLUENT	RECEIVING WATER	LABORATORY SEAWATER
pH - As Received	SU	7.23	7.47	8.07
Salinity - As Received	ppt	<1	<1	31
TRC	mg/L	<0.02	<0.02	- [a]

COMMENTS:
Additional water quality data are provided in Appendix A.
[a] TRC not measured in laboratory seawater.

TOXICITY TEST SUMMARY SHEET

FACILITY NAME: Kendall Green Energy Facility
NPDES PERMIT NO.: MA0004898
TEST START DATE: 09/22/15
TEST END DATE: 09/29/15

TEST TYPE	TEST SPECIES	SAMPLE TYPE	SAMPLE METHOD
___ Acute	___ *Pimephales promelas*	___ Prechlorinated	___ Grab
___ Chronic	___ *Ceriodaphnia dubia*	___ Dechlorinated	X Composite
X Modified Chronic (Reporting Acute Values)	___ *Daphnia pulex*	___ Chlorine Spiked in Lab	___ Flow-thru
	___ *Americamysis bahia*	___ Chlorinated on Site	___ Other
	___ *Cyprinodon variegatus*	___ Unchlorinated	
___ 24 Hour Screen	X *Menidia beryllina*	X No Detectable Chlorine Upon Receipt	
	___ *Arbacia punctulata*		

DILUTION WATER:

X Receiving water collected at a point upstream or away from the discharge, free from toxicity or other sources of contamination; Receiving Water Name: Charles River

___ Alternate surface water of known quality and hardness, to generally reflect the characteristics of the receiving water; Receiving Water Name: Hampton Seabrook estuary

___ Synthetic water prepared using either Millipore Milli-Q or equivalent deionized water and reagent grade chemicals; or deionized water combined with mineral water.

___ Artificial sea salts mixed with deionized water

___ Deionized water and hypersaline brine

___ Other

EFFLUENT SAMPLING DATES: 09/20-21/15 09/22-23/15 09/24-25/15

EFFLUENT CONCENTRATIONS TESTED (%): 6.25; 12.5; 25; 50; 100

Permit Limit Concentration: Report %

Was the effluent salinity adjusted? Yes If "yes", to what level? 24 ppt

REFERENCE TOXICANT TEST DATE: 09/29/15 LC-50: 6.4 mg/L Dodecyl Sodium Sulfate
09/29/15 NOEC: 2.5 mg/L Dodecyl Sodium Sulfate

PERMIT LIMITS AND TEST RESULTS

Test Acceptability Criteria

Mean Diluent Control Survival: 100 %

Mean Dry Weight/Fish: 0.846 mg

MSDp: 32.9 %

LIMITS		**RESULTS**	
LC-50:	- %	LC-50	>100 %
		Upper Limit:	- %
A-NOEC:	- %	Lower Limit:	- %
		Method:	Direct Observation
C-NOEC:	- %	A-NOEC	- %
		C-NOEC	100 %
		C-LOEC	>100 %
IC- ___	- %	IC- 25	>100 %

TOXICITY TEST SUMMARY SHEET

FACILITY NAME: Kendall Green Energy Facility TEST START DATE: 10/16/15
NPDES PERMIT NO.: MA0004898 TEST END DATE: 10/16/15

TEST TYPE	TEST SPECIES	SAMPLE TYPE	SAMPLE METHOD
___ Acute	___ *Pimephales promelas*	___ Prechlorinated	___ Grab
_X_ Chronic	___ *Ceriodaphnia dubia*	___ Dechlorinated	_X_ Composite
___ Modified Chronic (Reporting Acute Values)	___ *Daphnia pulex*	___ Chlorine Spiked in Lab	___ Flow-thru
	___ *Americamysis bahia*	___ Chlorinated on Site	___ Other
	___ *Cyprinodon variegatus*	___ Unchlorinated	
___ 24 Hour Screen	___ *Menidia beryllina*	_X_ No Detectable Chlorine Upon Receipt	
	_X_ *Arbacia punctulata*		

DILUTION WATER:

___ Receiving water collected at a point upstream or away from the discharge, free from toxicity or other sources of contamination; Receiving Water Name: Charles River

_X_ Alternate surface water of known quality and hardness, to generally reflect the characteristics of the receiving water; Receiving Water Name: Hampton Seabrook estuary

___ Synthetic water prepared using either Millipore Milli-Q or equivalent deionized water and reagent grade chemicals; or deionized water combined with mineral water.

___ Artificial sea salts mixed with deionized water

___ Deionized water and hypersaline brine

___ Other

EFFLUENT SAMPLING DATES: 10/15-16/15

EFFLUENT CONCENTRATIONS TESTED (%): 6.25; 12.5; 25; 50; 100

Permit Limit Concentration: Report %

Was the effluent salinity adjusted? Yes If "yes", to what level? 29 ppt

REFERENCE TOXICANT TEST DATE: 09/24/15 IC-25: 5.0 µg/L Copper
09/24/15 NOEC: 10.9 µg/L Copper

PERMIT LIMITS AND TEST RESULTS

Test Acceptability Criteria

Mean Diluent Control Fertilization: 76.6 % **MSDp:** 15.1 %

LIMITS		**RESULTS**	
LC-50:	- %	LC-50	- %
		Upper Limit:	- %
A-NOEC:	- %	Lower Limit:	- %
		Method:	Dunnett's
C-NOEC:	- %	A-NOEC	- %
		C-NOEC	50 %
		C-LOEC	100 %
IC- ___	- %	IC- 10	- %
		IC- 25	55.1 %

APPENDIX A

DATA SHEETS

STATISTICAL SUPPORT

METHODS USED IN NPDES PERMIT BIOMONITORING TESTING

Parameter	Method
Acute Exposure Bioassays:	
Ceriodaphnia dubia	EPA-821-R-02-012 2002.0
Daphnia pulex	EPA-821-R-02-012 2021.0
Pimephales promelas	EPA-821-R-02-012 2000.0
Americamysis bahia	EPA-821-R-02-012 2007.0
Menidia beryllina	EPA-821-R-02-012 2006.0
Cyprinodon variegatus	EPA-821-R-02-012 2004.0
Chronic Exposure Bioassays:	
Ceriodaphnia dubia	EPA-821-R-02-013 1002.0
Pimephales promelas	EPA-821-R-02-013 1000.0
Cyprinodon variegatus	EPA-821-R-02-014 1004.0
Menidia beryllina	EPA-821-R-02-014 1006.0
Arbacia punctulata	EPA-821-R-02-014 1008.0
Champia parvula	EPA-821-R-02-014 1009.0
Trace Metals:	
Trace Metals	EPA 200.8/SW 6020, EPA 245.7
Hardness	Standard Methods 22nd Edition - Method 2340 B
Wet Chemistries:	
Alkalinity	EPA 310.2
Chlorine, Residual	Standard Methods 22nd Edition - Method 4500-Cl D
Total Organic Carbon	Standard Methods 22nd Edition - Method 5310 C
Specific Conductance	Standard Methods 22nd Edition - Method 2510 B
Nitrogen - Ammonia	Standard Methods 22nd Edition - Method 4500-NH_3 G
pH	Standard Methods 22nd Edition - Method 4500-H+ B
Solids, Total (TS)	Standard Methods 22nd Edition - Method 2540 B
Solids, Total Dissolved (TDS)	Standard Methods 22nd Edition - Method 2540 C
Solids, Total Suspended (TSS)	Standard Methods 22nd Edition - Method 2540 D
Dissolved Oxygen	Standard Methods 22nd Edition - Method 4500-O G

Please visit our web site at www.envirosystems.com for a copy of our accreditations and state certifications.

The Commonwealth of Massachusetts

Department of Environmental Protection

Division of Environmental Analysis
Senator William X. Wall Experiment Station

certifies

M-NH906 **ENVIROSYSTEMS INC**
1 LAFAYETTE RD
HAMPTON, NH 03842-0000

Laboratory Director: **RUSSELL D. FOSTER**

for the analysis of **NON POTABLE WATER (CHEMISTRY)**

pursuant to 310 CMR 42.00

This certificate supersedes all previous Massachusetts certificates issued to this laboratory. The laboratory is regulated by and shall be responsible for being in compliance with Massachusetts regulations at 310 CMR 42.00.

This certificate is valid only when accompanied by the latest dated Certified Parameter List as issued by the Massachusetts D.E.P. Contact the Division of Environmental Analysis to verify the current certification status of the laboratory.

Certification is no guarantee of the validity of the data. This certification is subject to unannounced laboratory inspections.

Issued: **01 JUL 2015**

Expires: **30 JUN 2016**

Oscar C. Jacobs

Director, Division of Environmental Analysis

COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Certified Parameter List as of: 01 JUL 2015

M-NH906 ENVIROSYSTEMS INC
HAMPTON NH

NON POTABLE WATER (CHEMISTRY) **Effective Date 01 JUL 2015** **Expiration Date 30 JUN 2016**

Analytes	Methods
ALUMINUM	EPA 200.8
ANTIMONY	EPA 200.8
ARSENIC	EPA 200.8
BERYLLIUM	EPA 200.8
CADMIUM	EPA 200.8
CHROMIUM	EPA 200.8
COBALT	EPA 200.8
COPPER	EPA 200.8
IRON	EPA 200.8
LEAD	EPA 200.8
MANGANESE	EPA 200.8
MERCURY	EPA 245.7
MOLYBDENUM	EPA 200.8
NICKEL	EPA 200.8
SELENIUM	EPA 200.8
SILVER	EPA 200.8
THALLIUM	EPA 200.8
VANADIUM	EPA 200.8
ZINC	EPA 200.8
PH	SM 4500-H-B
SPECIFIC CONDUCTIVITY	SM 2510B
TOTAL DISSOLVED SOLIDS	SM 2540C
ALKALINITY, TOTAL	EPA 310.2
CHLORIDE	SM 4500-CL-C
CHLORIDE	EPA 300.0
SULFATE	EPA 300.0
AMMONIA-N	SM 4500-NH3-B, G
NITRATE-N	SM 4500-NO3-F
KJELDAHL-N	SM 4500-NH3-B, G
ORTHOPHOSPHATE	SM 4500-P-E
PHOSPHORUS, TOTAL	SM 4500-P-B,E
BIOCHEMICAL OXYGEN DEMAND	SM 5210B
TOTAL ORGANIC CARBON	SM 5310C
CYANIDE, TOTAL	SM 4500-CN-C,E
NON-FILTERABLE RESIDUE	SM 2540D
OIL AND GREASE	EPA 1664
VOLATILE HALOCARBONS	EPA 624
VOLATILE AROMATICS	EPA 624
CHLORDANE	EPA 608
ALDRIN	EPA 608
DIELDRIN	EPA 608
DDD	EPA 608
DDE	EPA 608

COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Certified Parameter List as of: 01 JUL 2015

M-NH906 **ENVIROSYSTEMS INC**
HAMPTON NH

NON POTABLE WATER (CHEMISTRY) **Effective Date** **01 JUL 2015** **Expiration Date** **30 JUN 2016**

Analytes	Methods
DDT	EPA 608
HEPTACHLOR	EPA 608
HEPTACHLOR EPOXIDE	EPA 608
SVOC-ACID EXTRACTABLES	EPA 625
SVOC-BASE/NEUTRAL EXTRACTABLES	EPA 625
POLYCHLORINATED BIPHENYLS (WATEF	EPA 608

Menidia beryllina 7 DAY CHRONIC ASSAY

STUDY:	CLIENT:	SAMPLE:	DILUENT:	FISH/BATCH:
Z6494	ESS Laboratories	Effluent - Kendall Station	Receiving Water	09MbABS092215

		NUMBER OF SURVIVORS								OLD DISSOLVED OXYGEN (mg/L)						
CON	REP	0	1	2	3	4	5	6	7	1	2	3	4	5	6	7
LAB SALT	A	10	10	10	10	10	10	10	10	6.2	6.0	5.3	5.6	5.8	5.8	6.0
	B	10	10	10	10	10	10	10	10	6.0	6.0	5.1	5.5	5.7	6.0	6.0
	C	10	10	10	10	10	10	10	10	5.9	6.0	5.0	5.6	5.7	5.8	6.0
	D	10	10	10	10	10	10	10	10	5.6	5.8	4.9	5.6	5.7	5.6	5.9
RW	A	10	10	10	10	10	10	10	10	5.1	5.5	4.9	5.5	5.6	5.3	5.9
	B	10	10	10	10	10	10	10	10	5.1	5.4	4.9	5.5	5.5	5.3	5.6
	C	10	10	10	10	10	10	10	10	5.1	5.5	4.8	5.4	5.3	5.1	5.6
	D	10	10	10	10	10	10	10	10	5.1	5.5	4.8	5.3	5.2	5.1	5.5
6.25%	A	10	10	10	10	10	10	10	10	5.0	5.5	4.7	5.2	5.2	5.1	5.4
	B	10	10	10	10	10	10	10	10	5.0	5.4	4.7	5.2	5.1	5.0	5.3
	C	10	10	10	10	10	10	10	10	5.1	5.4	4.6	5.1	5.0	5.2	5.3
	D	10	10	10	10	10	10	10	10	5.2	5.5	4.6	5.1	5.0	5.2	5.4
12.5%	A	10	10	10	10	10	10	10	10	5.4	5.7	4.9	5.3	5.2	5.3	5.5
	B	10	9	9	9	9	9	9	9	5.6	5.8	4.8	5.0	5.2	5.1	5.3
	C	10	10	10	10	10	10	10	10	5.5	5.8	4.6	4.9	5.1	5.1	5.2
	D	10	10	10	10	10	10	10	10	5.4	5.6	4.6	4.9	5.0	5.0	5.2
25%	A	10	10	10	10	9	9	9	9	5.3	5.6	4.7	4.8	5.0	5.0	5.2
	B	10	10	10	10	10	10	10	10	5.3	5.5	5.0	4.9	5.0	5.1	5.1
	C	10	10	10	10	10	10	10	10	5.3	5.4	5.0	4.9	5.0	5.2	5.3
	D	10	10	10	10	10	10	10	10	5.3	5.6	4.9	5.0	5.0	5.2	5.4
50%	A	10	10	10	10	10	10	10	10	5.5	5.6	4.9	5.1	5.0	5.3	5.3
	B	10	10	10	10	10	10	10	10	5.4	5.5	4.9	5.1	4.9	5.1	5.2
	C	10	10	10	10	10	10	10	10	5.5	5.4	4.9	5.2	4.8	4.6	5.2
	D	10	10	10	10	10	10	10	10	5.5	5.3	5.0	5.4	4.7	4.5	5.1
100%	A	10	10	10	10	10	10	10	10	5.4	5.6	4.9	5.3	4.7	4.7	5.2
	B	10	10	10	10	10	10	10	9	5.2	5.4	5.1	5.5	4.5	4.6	4.7
	C	10	10	10	10	10	10	10	10	5.4	5.2	5.0	5.3	4.4	4.6	4.7
	D	10	10	9	9	9	9	9	9	5.4	5.3	5.0	5.4	4.6	4.6	4.7
INC TEMP:		25	25	25	25	25	25	25	25							
DATE:		9/22/15	9/23/15	9/24	9/25	9/26	09/27	09/28	9/29 09/12							
TIME:		1530	1230	1000	1045	0945	1120	1400	0855 1053							
INITIALS:		EH	EB	NP	NP	NP	EH	HK	NP EH							

EB NP
9/29

STUDY: 26494
CLIENT: ESS Labratories
PROJECT:
ASSAY: ESS
TASK: Dry Weight Data - Balance Output File
BALANCE: Ohaus Discovery Balance Model DV215CD
Serial #: 1124024313

		Date / Init: 10/07/15 LB	09/29/15 1310 CS	Duplicates	
Sample	Rep	Total Wt (mg)	Tare Wt (mg)	Total Wt (mg)	Tare Wt (mg)
Lab	A	16.50	7.27	16.5	7.21
Lab	B	17.05	9.32		
Lab	C	17.32	7.49	Removed Salt	
Lab	D	19.43	9.64		
RW	A	14.40	6.15		
RW	B	16.85	7.80		
RW	C	16.98	8.36		
RW	D	19.18	11.26		
6.25%	A	18.34	9.54		
6.25%	B	17.29	7.52		
6.25%	C	17.28	9.06		
6.25%	D	18.36	10.54		10.58
12.5%	A	14.13	6.92	14.1	
12.5%	B	17.02	7.94		
12.5%	C	19.71	10.08		
12.5%	D	19.33	9.64		
25%	A	17.41	9.10		
25%	B	15.85	8.76		
25%	C	34.27	25.60		
25%	D	20.31	10.10		
50%	A	18.22	9.50		
50%	B	15.49	7.06		
50%	C	20.96	9.98		10.02
50%	D	19.56	9.75	Removed Salt	
100%	A	21.90	7.53	21.92	Removed Salt
100%	B	20.04	11.16		
100%	C	17.80	11.04		
100%	D	22.08	10.65		

Menidia beryllina 7-d Larval Survival and Growth Test — **EnviroSystems, Inc.**

Batch ID:	00-7173-5136	**Test Type:**	Growth-Survival (7d)	**Analyst:**	Kirk Cram
Start Date:	22 Sep-15 15:30	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Receiving Water
Ending Date:	29 Sep-15 10:55	**Species:**	Menidia beryllina	**Brine:**	Generic commercial salts
Duration:	6d 19h	**Source:**	ABS - Aquatic Biosystems, CO	**Age:**	10 d

Sample ID:	02-5542-9832	**Code:**	26494	**Client:**	ESS Laboratory
Sample Date:	21 Sep-15 08:00	**Material:**	Power Plant Effluent	**Project:**	Third Quarter WET Compliance Test
Receive Date:	21 Sep-15 14:55	**Source:**	Kendall Green Energy Facility		
Sample Age:	32h (4 °C)	**Station:**	Kendall Green Energy (MA0004898)		

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
07-4121-0999	7d Proportion Survived	100	>100	NA	6.72%	1	Steel Many-One Rank Sum Test
05-4280-7883	Mean Dry Biomass-mg	100	>100	NA	32.9%	1	Dunnett Multiple Comparison Test
21-1392-4416	Mean Dry Weight-mg	100	>100	NA	33.8%	1	Dunnett Multiple Comparison Test

Point Estimate Summary

Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method
21-3162-8888	Mean Dry Biomass-mg	IC25	>100	N/A	N/A	<1	Linear Interpolation (ICPIN)

Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits	Overlap	Decision
07-4121-0999	7d Proportion Survived	Control Resp	1	0.8 - NL	Yes	Passes Acceptability Criteria
05-4280-7883	Mean Dry Biomass-mg	Control Resp	0.846	0.5 - NL	Yes	Passes Acceptability Criteria
21-3162-8888	Mean Dry Biomass-mg	Control Resp	0.846	0.5 - NL	Yes	Passes Acceptability Criteria
05-4280-7883	Mean Dry Biomass-mg	PMSD	0.3295	0.11 - 0.28	Yes	Above Acceptability Criteria

7d Proportion Survived Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Lab Seawater	4	1	1	1	1	1	0	0	0.0%	0.0%
0	Receiving Water	4	1	1	1	1	1	0	0	0.0%	0.0%
6.25		4	1	1	1	1	1	0	0	0.0%	0.0%
12.5		4	0.975	0.8954	1	0.9	1	0.025	0.05	5.13%	2.5%
25		4	0.975	0.8954	1	0.9	1	0.025	0.05	5.13%	2.5%
50		4	1	1	1	1	1	0	0	0.0%	0.0%
100		4	0.95	0.8581	1	0.9	1	0.02887	0.05774	6.08%	5.0%

Mean Dry Biomass-mg Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Lab Seawater	4	0.9145	0.7582	1.071	0.773	0.983	0.04911	0.09823	10.74%	0.0%
0	Receiving Water	4	0.846	0.7686	0.9234	0.792	0.905	0.02431	0.04863	5.75%	7.49%
6.25		4	0.8653	0.7305	1	0.782	0.977	0.04233	0.08467	9.79%	5.39%
12.5		4	0.8902	0.7055	1.075	0.721	0.969	0.05806	0.1161	13.04%	2.65%
25		4	0.857	0.6524	1.062	0.709	1.021	0.06428	0.1286	15.0%	6.29%
50		4	0.9485	0.7639	1.133	0.843	1.098	0.05802	0.116	12.23%	-3.72%
100		4	1.036	0.5133	1.559	0.676	1.437	0.1643	0.3285	31.71%	-13.29%

Mean Dry Weight-mg Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Lab Seawater	4	0.9145	0.7582	1.071	0.773	0.983	0.04911	0.09823	10.74%	0.0%
0	Receiving Water	4	0.846	0.7686	0.9234	0.792	0.905	0.02431	0.04863	5.75%	7.49%
6.25		4	0.8653	0.7305	1	0.782	0.977	0.04233	0.08467	9.79%	5.39%
12.5		4	0.9155	0.7066	1.124	0.721	1.009	0.06562	0.1312	14.34%	-0.11%
25		4	0.8801	0.6723	1.088	0.709	1.021	0.0653	0.1306	14.84%	3.76%
50		4	0.9485	0.7639	1.133	0.843	1.098	0.05802	0.116	12.23%	-3.72%
100		4	1.092	0.5608	1.624	0.676	1.437	0.167	0.3341	30.58%	-19.46%

Menidia beryllina 7-d Larval Survival and Growth Test — **EnviroSystems, Inc.**

7d Proportion Survived Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Lab Seawater	1	1	1	1
0	Receiving Water	1	1	1	1
6.25		1	1	1	1
12.5		1	0.9	1	1
25		0.9	1	1	1
50		1	1	1	1
100		1	0.9	1	0.9

Mean Dry Biomass-mg Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Lab Seawater	0.923	0.773	0.983	0.979
0	Receiving Water	0.825	0.905	0.862	0.792
6.25		0.88	0.977	0.822	0.782
12.5		0.721	0.908	0.963	0.969
25		0.831	0.709	0.867	1.021
50		0.872	0.843	1.098	0.981
100		1.437	0.888	0.676	1.143

Mean Dry Weight-mg Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Lab Seawater	0.923	0.773	0.983	0.979
0	Receiving Water	0.825	0.905	0.862	0.792
6.25		0.88	0.977	0.822	0.782
12.5		0.721	1.009	0.963	0.969
25		0.9233	0.709	0.867	1.021
50		0.872	0.843	1.098	0.981
100		1.437	0.9867	0.676	1.27

7d Proportion Survived Binomials

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Lab Seawater	10/10	10/10	10/10	10/10
0	Receiving Water	10/10	10/10	10/10	10/10
6.25		10/10	10/10	10/10	10/10
12.5		10/10	9/10	10/10	10/10
25		9/10	10/10	10/10	10/10
50		10/10	10/10	10/10	10/10
100		10/10	9/10	10/10	9/10

Sample ID:	02-5542-9832	**Code:**	26494	**Client:**	ESS Laboratory
Sample Date:	21 Sep-15 08:00	**Material:**	Power Plant Effluent	**Project:**	Third Quarter WET Compliance Test
Receive Date:	21 Sep-15 14:55	**Source:**	Kendall Green Energy Facility		
Sample Age:	32h (4 °C)	**Station:**	Kendall Green Energy (MA0004898)		

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	NOEL	LOEL	TOEL	TU
Angular (Corrected)	NA	C > T	NA	NA	6.72%	100	>100	NA	1

Steel Many-One Rank Sum Test

Control	vs	C-%	Test Stat	Critical	Ties	DF	P-Value	P-Type	Decision(α:5%)
Receiving Water		6.25	18	10	1	6	0.8333	Asymp	Non-Significant Effect
		12.5	16	10	1	6	0.6105	Asymp	Non-Significant Effect
		25	16	10	1	6	0.6105	Asymp	Non-Significant Effect
		50	18	10	1	6	0.8333	Asymp	Non-Significant Effect
		100	14	10	1	6	0.3451	Asymp	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.02213278	0.004426555	5	1.2	0.3485	Non-Significant Effect
Error	0.06639833	0.003688796	18			
Total	0.08853111		23			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Mod Levene Equality of Variance	2	4.248	0.1274	Equal Variances
Variances	Levene Equality of Variance	10.4	4.248	<0.0001	Unequal Variances
Distribution	Shapiro-Wilk W Normality	0.8314	0.884	0.0010	Non-normal Distribution

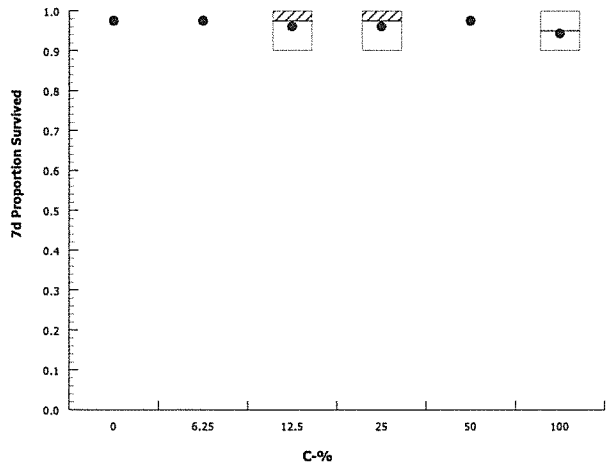
7d Proportion Survived Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Receiving Water	4	1	1	1	1	1	1	0	0.0%	0.0%
6.25		4	1	1	1	1	1	1	0	0.0%	0.0%
12.5		4	0.975	0.8954	1	1	0.9	1	0.025	5.13%	2.5%
25		4	0.975	0.8954	1	1	0.9	1	0.025	5.13%	2.5%
50		4	1	1	1	1	1	1	0	0.0%	0.0%
100		4	0.95	0.8581	1	0.95	0.9	1	0.02887	6.08%	5.0%

Angular (Corrected) Transformed Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Receiving Wate	4	1.412	1.412	1.412	1.412	1.412	1.412	0	0.0%	0.0%
6.25		4	1.412	1.412	1.412	1.412	1.412	1.412	0	0.0%	0.0%
12.5		4	1.371	1.242	1.501	1.412	1.249	1.412	0.04074	5.94%	2.89%
25		4	1.371	1.242	1.501	1.412	1.249	1.412	0.04074	5.94%	2.89%
50		4	1.412	1.412	1.412	1.412	1.412	1.412	0	0.0%	0.0%
100		4	1.331	1.181	1.48	1.331	1.249	1.412	0.04705	7.07%	5.77%

Graphics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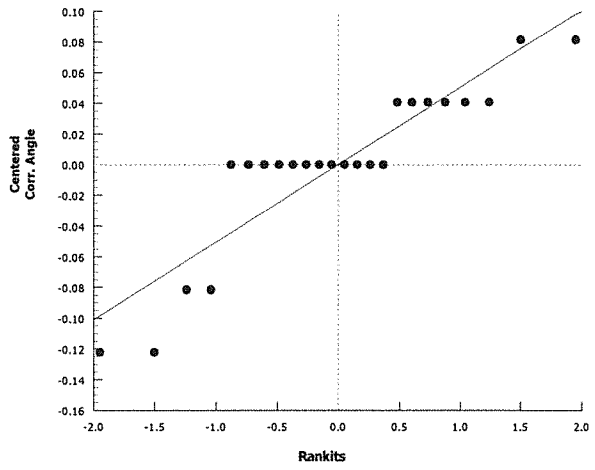
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0
6.25
12.5
25
50
100
C-%


Centered Corr. Angle
0.10
0.08
0.06
0.04
0.02
0.00
-0.02
-0.04
-0.06
-0.08
-0.10
-0.12
-0.14
-0.16
-2.0
-1.5
-1.0
-0.5
0.0
0.5
1.0
1.5
2.0
Rankits

Sample ID:	02-5542-9832	**Code:**	26494	**Client:**	ESS Laboratory
Sample Date:	21 Sep-15 08:00	**Material:**	Power Plant Effluent	**Project:**	Third Quarter WET Compliance Test
Receive Date:	21 Sep-15 14:55	**Source:**	Kendall Green Energy Facility		
Sample Age:	32h (4 °C)	**Station:**	Kendall Green Energy (MA0004898)		

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	NOEL	LOEL	TOEL	TU
Untransformed	NA	C > T	NA	NA	32.9%	100	>100	NA	1

Dunnett Multiple Comparison Test

Control	vs C-%	Test Stat	Critical	MSD	DF	P-Value	P-Type	Decision(α:5%)
Receiving Water	6.25	-0.1662	2.407	0.279	6	0.8776	CDF	Non-Significant Effect
	12.5	-0.3821	2.407	0.279	6	0.9215	CDF	Non-Significant Effect
	25	-0.09499	2.407	0.279	6	0.8598	CDF	Non-Significant Effect
	50	-0.8851	2.407	0.279	6	0.9766	CDF	Non-Significant Effect
	100	-1.641	2.407	0.279	6	0.9973	CDF	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.1064308	0.02128617	5	0.7936	0.5681	Non-Significant Effect
Error	0.4827744	0.0268208	18			
Total	0.5892052		23			

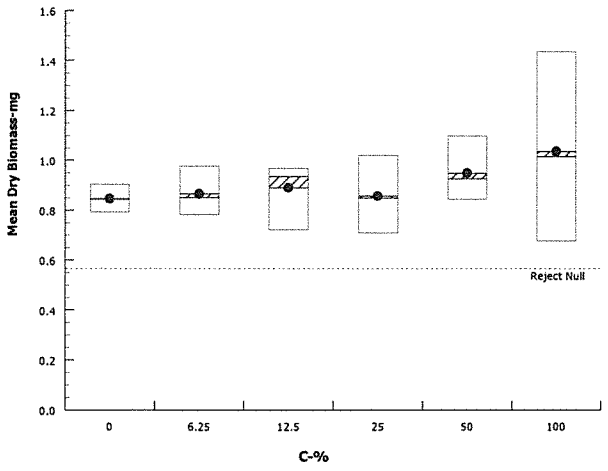
Distributional Tests

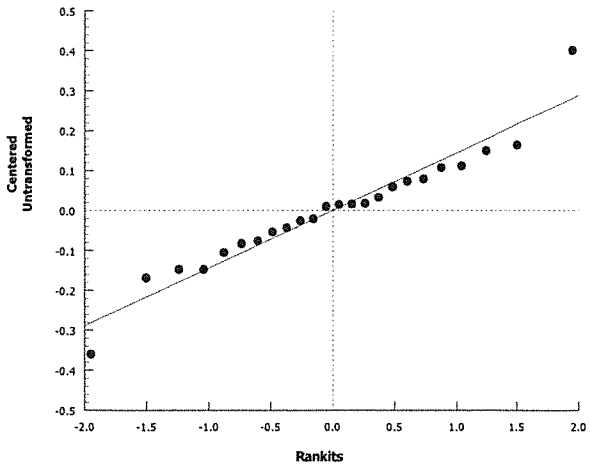
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	11.2	15.09	0.0476	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.9536	0.884	0.3233	Normal Distribution

Mean Dry Biomass-mg Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Receiving Water	4	0.846	0.7686	0.9234	0.8435	0.792	0.905	0.02431	5.75%	0.0%
6.25		4	0.8653	0.7305	1	0.851	0.782	0.977	0.04233	9.79%	-2.28%
12.5		4	0.8902	0.7055	1.075	0.9355	0.721	0.969	0.05806	13.04%	-5.23%
25		4	0.857	0.6524	1.062	0.849	0.709	1.021	0.06428	15.0%	-1.3%
50		4	0.9485	0.7639	1.133	0.9265	0.843	1.098	0.05802	12.23%	-12.12%
100		4	1.036	0.5133	1.559	1.016	0.676	1.437	0.1643	31.71%	-22.46%

Graphics





Sample ID:	02-5542-9832	**Code:**	26494	**Client:**	ESS Laboratory
Sample Date:	21 Sep-15 08:00	**Material:**	Power Plant Effluent	**Project:**	Third Quarter WET Compliance Test
Receive Date:	21 Sep-15 14:55	**Source:**	Kendall Green Energy Facility		
Sample Age:	32h (4 °C)	**Station:**	Kendall Green Energy (MA0004898)		

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Log(X+1)	Linear	634199	200	Yes	Two-Point Interpolation

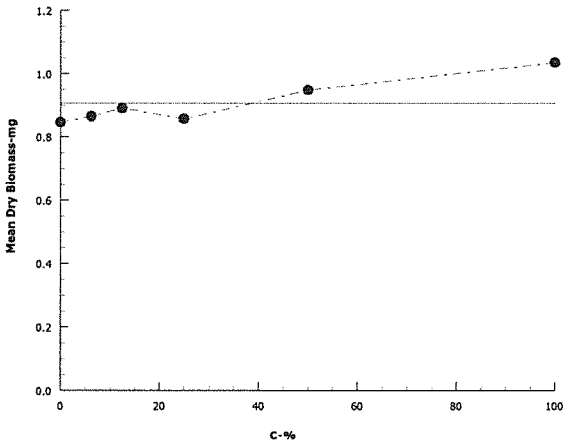
Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC25	>100	N/A	N/A	<1	NA	NA

Mean Dry Biomass-mg Summary

			Calculated Variate						
C-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Receiving Water	4	0.846	0.792	0.905	0.02431	0.04863	5.75%	0.0%
6.25		4	0.8653	0.782	0.977	0.04233	0.08467	9.79%	-2.28%
12.5		4	0.8902	0.721	0.969	0.05806	0.1161	13.04%	-5.23%
25		4	0.857	0.709	1.021	0.06428	0.1286	15.0%	-1.3%
50		4	0.9485	0.843	1.098	0.05802	0.116	12.23%	-12.12%
100		4	1.036	0.676	1.437	0.1643	0.3285	31.71%	-22.46%

Graphics



1300 Blue Spruce Drive, Suite C
Fort Collins, Colorado 80524

AQUATIC BIO SYSTEMS ABS INC.

Toll Free: 800/331-5916
Tel: 970/484-5091 Fax:970/484-2514

10 ~~09~~ 10/21/15
Lot #: ~~09~~MbABS092215

ORGANISM HISTORY

DATE:	9/21/2015
SPECIES:	*Menidia beryllina*
AGE:	9 day
LIFE STAGE:	Juvenile
HATCH DATE:	9/12/2015
BEGAN FEEDING:	Immediately
FOOD:	Rotifers, *Artemia* sp.

Water Chemistry Record:	Current	Range
TEMPERATURE:	26°C	23-26 °C
SALINITY/CONDUCTIVITY:	25 ppt	23-26 ppt
TOTAL HARDNESS (as $CaCO_3$):	--	--
TOTAL ALKALINITY (as $CaCO_3$):	155 mg/l	150-210 mg/l
pH:	8.08	7.56-8.21

Comments:

Facility Supervisor

Arbacia punctulata Chronic Fertilization Assay

STUDY:	CLIENT:	SAMPLE/DILUENT:	DATE:
26633	ESS Laboratories Kendall	E3 LT 10/16 EFFLUENT/~~RECEIVING WATER~~ 30ppt Lab Salt	10/16/15
			INITIALS:

SALINITY ADJUSTMENT RECORD: 1000 ml EFFLUENT + 34 g SALT = 100% ACTUAL PERCENTAGE

SALINITY ADJUSTMENT RECORD: 1000 ml DILUENT + 34 g SALT = 100% ACTUAL PERCENTAGE

EFFLUENT CONCENTRATION)	D.O. (mg/L)	pH (SU)	TEMPERATURE (°C)	SALINITY (ppt)	TRC (mg/L)
"AS RECEIVED" EFFLUENT	8.0	7.23	23	0.9	<0.02
"AS RECEIVED" Receiving Water	8.8	7.47	23	0.8	<0.02
LAB SALT	7.1	8.07	20	31	
RECEIVING WATER	8.2	8.26	20	30	
6.25%	7.2	8.09	20	31	
12.5%	7.2	8.09	20	30	
25%	7.2	8.09	20	31	
50%	7.3	8.11	19	30	
100%	7.9	8.16	18	29	

INCUBATOR TEMP °C:	20
DATE:	10/16/15
TIME:	1435
INITIALS:	

SPERM DILUTIONS:

HEMACYTOMETER COUNT, E: 122 X 10^4 = SPM SOLUTION D = 1.22×10^6

SPERM CONCENTRATIONS:
SOLUTION E X 40 = SOLUTION A = 4.88×10^7 SPM
SOLUTION E X 20 = SOLUTION B = 2.44×10^7 SPM
SOLUTION E X 5 = SOLUTION C = 6.10×10^6 SPM

FINAL COUNTS:

FINAL SPERM COUNT: 1.22×10^6
FINAL EGG COUNT: 2600

ORGANISM LOT: MAp033115

TEST TIMES:

STATION #: 1

SPERM COLLECTED: 1335
EGGS COLLECTED: 1335
SPERM ADDED: 1455
EGGS ADDED: 1535
FIXATIVE ADDED: 1555

Arbacia punctulata Chronic Fertilization Assay

STUDY: 26633	CLIENT: ESS Laboratories	SAMPLE/DILUENT: (E3) 10/14 EFFLUENT / ~~RECEIVING WATER~~ 30 ppt. Lab Salt	DATE: 10/14/15 / 10/15/15 TIME: 1600 / 0805 INITIALS: UB / EH

EFFLUENT CONC.	REPLICATE VIAL			
	1 UNFERT/TOTAL	2 UNFERT/TOTAL	3 UNFERT/TOTAL	4 UNFERT/TOTAL
LAB SALT	83/106	76/100	64/100	88/100
RW	87/103	81/100	81/100	80/100
6.25%	67/105	81/104	60/104	70/102
12.5%	60/105	74/101	75/104	59/103
25%	73/110	60/106	58/102	64/101
50%	76/103	73/100 ~~64/107~~ EHEH	71/107	78/115
100%	11/100	8/100	6/101	11/100

Arbacia Sperm Cell Fertilization Test — EnviroSystems, Inc.

Batch ID:	04-4164-1237	**Test Type:**	Fertilization	**Analyst:**	
Start Date:	16 Oct-15 14:35	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Laboratory Seawater
Ending Date:	16 Oct-15 15:55	**Species:**	Arbacia punctulata	**Brine:**	Generic commercial salts
Duration:	80m	**Source:**	In-House Culture	**Age:**	

Sample ID:	15-4818-4362	**Code:**	26633	**Client:**	ESS Laboratory
Sample Date:	16 Oct-15 11:45	**Material:**	Power Plant Effluent	**Project:**	Third Quarter WET Compliance Test
Receipt Date:	16 Oct-15 13:15	**Source:**	Kendall Green Energy Facility		
Sample Age:	3h (2 °C)	**Station:**	Kendall Green Energy (MA0004898)		

Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	NOEL	LOEL	TOEL	TU	PMSD	
14-8103-8226	Proportion Fertilized	Dunnett Multiple Comparison Test	12.5	25	17.68	8	15.1%	✓
17-5597-8626	Proportion Fertilized	Dunnett Multiple Comparison Test	12.5	25	17.68	8	15.1%	✓

Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	Level	%	95% LCL	95% UCL	TU	
10-4335-0249	Proportion Fertilized	Linear Interpolation (ICPIN)	EC25	55.1	47.2	62.9	1.815	✓
12-6894-6112	Proportion Fertilized	Linear Interpolation (ICPIN)	EC25	55.1	47.9	62.5	1.815	✓

Test Acceptability

				TAC Limits			
Analysis ID	**Endpoint**	**Attribute**	**Test Stat**	**Lower**	**Upper**	**Overlap**	**Decision**
10-4335-0249	Proportion Fertilized	Control Resp	0.766	0.7	1	Yes	Passes Acceptibility Criteria
12-6894-6112	Proportion Fertilized	Control Resp	0.766	0.7	1	Yes	Passes Acceptibility Criteria
14-8103-8226	Proportion Fertilized	Control Resp	0.766	0.7	1	Yes	Passes Acceptibility Criteria
17-5597-8626	Proportion Fertilized	Control Resp	0.766	0.7	1	Yes	Passes Acceptibility Criteria
14-8103-8226	Proportion Fertilized	PMSD	0.151	0	0.25	Yes	Passes Acceptibility Criteria
17-5597-8626	Proportion Fertilized	PMSD	0.151	0	0.25	Yes	Passes Acceptibility Criteria

Proportion Fertilized Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LS	4	0.766	0.609	0.923	0.640	0.880	0.049	0.099	12.88%	0.00%
0	RW	4	0.816	0.785	0.847	0.800	0.845	0.010	0.020	2.40%	-6.58%
6.25		4	0.670	0.534	0.806	0.577	0.779	0.043	0.085	12.72%	12.50%
12.5		4	0.650	0.507	0.792	0.571	0.733	0.045	0.090	13.78%	15.18%
25		4	0.608	0.531	0.685	0.566	0.664	0.024	0.049	7.98%	20.60%
50		4	0.702	0.644	0.761	0.664	0.738	0.019	0.037	5.27%	8.27%
100		4	0.090	0.051	0.129	0.059	0.110	0.012	0.025	27.53%	88.27%

Proportion Fertilized Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	LS	0.783	0.760	0.640	0.880
0	RW	0.845	0.810	0.810	0.800
6.25		0.638	0.779	0.577	0.686
12.5		0.571	0.733	0.721	0.573
25		0.664	0.566	0.569	0.634
50		0.738	0.730	0.664	0.678
100		0.110	0.080	0.059	0.110

Arbacia Sperm Cell Fertilization Test — **EnviroSystems, Inc.**

Analysis ID:	17-5597-8626	**Endpoint:**	Proportion Fertilized	**CETIS Version:**	CETISv1.8.6
Analyzed:	20 Oct-15 11:05	**Analysis:**	Parametric-Control vs Treatments	**Official Results:**	Yes
Sample ID:	15-4818-4362	**Code:**	26633	**Client:**	ESS Laboratory
Sample Date:	16 Oct-15 11:45	**Material:**	Power Plant Effluent	**Project:**	Third Quarter WET Compliance Test
Receipt Date:	16 Oct-15 13:15	**Source:**	Kendall Green Energy Facility		
Sample Age:	3h (2 °C)	**Station:**	Kendall Green Energy (MA0004898)		

Data Transform	Alt Hyp	Trials	Seed	TST b	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)	C > T	n/a	n/a	n/a	12.5	25	17.68	8	15.1%

Dunnett Multiple Comparison Test

Control vs	Conc-%	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Seawater	6.25	1.98	2.41	0.135	6	CDF	0.1077	Non-Significant Effect
	12.5	2.37	2.41	0.135	6	CDF	0.0533	Non-Significant Effect
	25*	3.17	2.41	0.135	6	CDF	0.0108	Significant Effect
	50	1.39	2.41	0.135	6	CDF	0.2643	Non-Significant Effect
	100*	13.7	2.41	0.135	6	CDF	2.7E-05	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	1.56788	0.313575	5	49.9	<1.0E-37	Significant Effect
Error	0.113031	0.00628	18			
Total	1.68091		23			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	5.19	15.1	0.3933	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.989	0.884	0.9932	Normal Distribution

Proportion Fertilized Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	LS	4	0.766	0.609	0.923	0.772	0.640	0.880	0.049	12.88%	0.00%
6.25		4	0.670	0.534	0.806	0.662	0.577	0.779	0.043	12.72%	12.50%
12.5		4	0.650	0.507	0.792	0.647	0.571	0.733	0.045	13.78%	15.18%
25		4	0.608	0.531	0.685	0.601	0.566	0.664	0.024	7.98%	20.60%
50		4	0.702	0.644	0.761	0.704	0.664	0.738	0.019	5.27%	8.27%
100		4	0.090	0.051	0.129	0.095	0.059	0.110	0.012	27.53%	88.27%

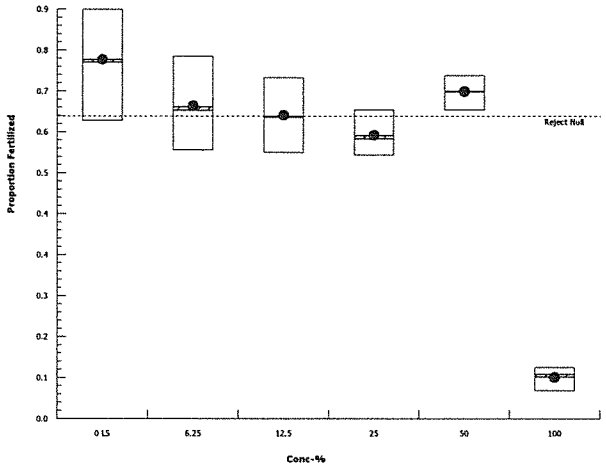
Angular (Corrected) Transformed Summary

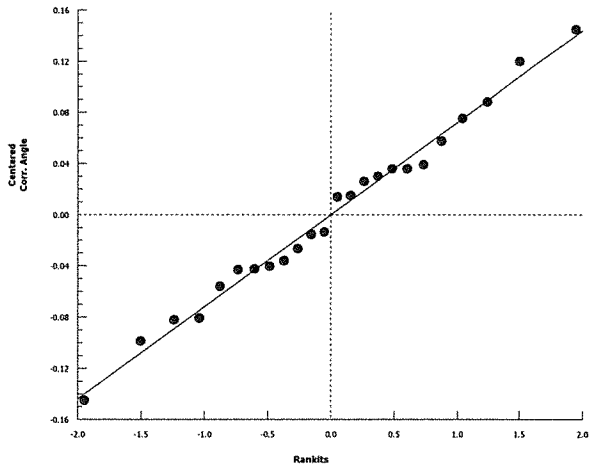
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	LS	4	1.07	0.883	1.26	1.07	0.927	1.22	0.0594	11.08%	0.00%
6.25		4	0.961	0.814	1.11	0.951	0.863	1.08	0.0462	9.61%	10.35%
12.5		4	0.939	0.789	1.09	0.936	0.857	1.03	0.0472	10.04%	12.40%
25		4	0.895	0.815	0.974	0.887	0.852	0.952	0.0249	5.58%	16.57%
50		4	0.994	0.93	1.06	0.996	0.952	1.03	0.0203	4.07%	7.27%
100		4	0.302	0.231	0.373	0.312	0.246	0.338	0.0223	14.73%	71.81%

Arbacia Sperm Cell Fertilization Test — **EnviroSystems, Inc.**

Analysis ID:	17-5597-8626	**Endpoint:**	Proportion Fertilized	**CETIS Version:**	CETISv1.8.6
Analyzed:	20 Oct-15 11:05	**Analysis:**	Parametric-Control vs Treatments	**Official Results:**	Yes

Graphics





Arbacia Sperm Cell Fertilization Test — **EnviroSystems, Inc.**

Analysis ID:	12-6894-6112	**Endpoint:**	Proportion Fertilized	**CETIS Version:**	CETISv1.8.6
Analyzed:	20 Oct-15 11:05	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Sample ID:	15-4818-4362	**Code:**	26633	**Client:**	ESS Laboratory
Sample Date:	16 Oct-15 11:45	**Material:**	Power Plant Effluent	**Project:**	Third Quarter WET Compliance Test
Receipt Date:	16 Oct-15 13:15	**Source:**	Kendall Green Energy Facility		
Sample Age:	3h (2 °C)	**Station:**	Kendall Green Energy (MA0004898)		

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Log(X+1)	Linear	1338279	200	Yes	Two-Point Interpolation

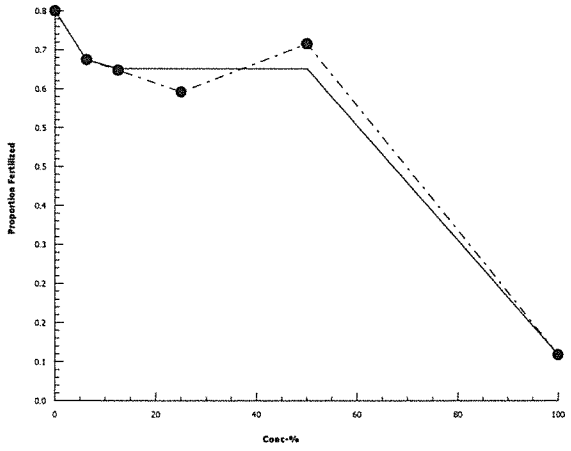
Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
EC25	55.1	47.9	62.5	1.815	1.601	2.086

Proportion Fertilized Summary

			Calculated Variate(A/B)								
Conc-%	Code	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect	A	B
0	LS	4	0.766	0.640	0.880	0.049	0.099	12.88%	0.00%	311	406
6.25		4	0.670	0.577	0.779	0.043	0.085	12.72%	12.50%	278	415
12.5		4	0.650	0.571	0.733	0.045	0.090	13.78%	15.18%	268	413
25		4	0.608	0.566	0.664	0.024	0.049	7.98%	20.60%	254	419
50		4	0.702	0.664	0.738	0.019	0.037	5.27%	8.27%	298	425
100		4	0.090	0.059	0.110	0.012	0.025	27.53%	88.27%	36	401

Graphics



M. beryllina 7 Day Chronic Assay

STUDY: 260494	CLIENT: ESS Laboratories	SAMPLE: EFFLUENT	DILUENT: RECEIVING WATER (RW)
	DAY 0 (START) DATE: 09/21/15	DAY 2 (1ST RENEWAL) DATE: 9/24/15	DAY 4 (2ND RENEWAL) DATE: 9/26/15

CHEMISTRIES SAMPLED

CHEMISTRY	START EFFLUENT	START DILUENT	1ST EFFLUENT	1ST DILUENT	2ND EFFLUENT	2ND DILUENT
AMM						
TS/TSS						
TOC						
METALS						

AS RECEIVED & SALINITY ADJUSTED WATER QUALITIES

AS REC'D	EFFLUENT	DILUENT	EFFLUENT	DILUENT	EFFLUENT	DILUENT
SALINITY (ppt)	1.3	1.3	1.4	1.5	1.6	1.5
pH (SU)	7.67	8.49	7.63	8.60	7.39	7.73
TRC (mg/L)	<0.02	<0.02	<0.02	<0.02	<0.02	0.051
SAL. ADJ.	**EFFLUENT**	**DILUENT**	**EFFLUENT**	**DILUENT**	**EFFLUENT**	**DILUENT**
SALINITY (ppt)	24	25	25	24	26	25
pH (SU)	8.20	8.33	8.19	8.27	8.13	8.19
TRC (mg/L)	—	—	<0.02	<0.02	~~<0.02~~	<0.02

SALINITY ADJUSTMENT RECORD

	START EFFLUENT	START DILUENT	1ST EFFLUENT	1ST DILUENT	2ND EFFLUENT	2ND DILUENT
SAMPLE mLs	~~12000~~ 8000	~~8~~ 12000	8000	16000	12,000	20,000
SEA SALT g (A-)	~~328~~ 218	328	217.5	433.2	323	541
TOTAL mLs	~~12000~~ 8000	12000	8000	16000	12,000	20,000
ACTUAL %	100%	100%	100%	100%	100%	100%
DATE:	09/21/15	09/21/15	9/23/15	9/23/15	9/25/15	9/25/15
TIME:	1510	1515	1525	1525	1320	1340
INITIALS:	EH	EH	NP	NP	BL	BL

@EH 09/21 *Did 1st Renewal sample cause ≥50% mortality? Yes _____ No X*
If "YES" pull TS,TSS,& put into circulation TOC and METALS bottles. _____

Did 2nd Renewal sample cause ≥50% mortality? Yes _____ No X

FRESHWATER CHRONIC ASSAY - NEW WATER QUALITIES

STUDY: Z6494 CLIENT: ESS Laboratories DILUENT: Receiving Water

NEW DISSOLVED OXYGEN (mg/L)

CONC	REP	0	1	2	3	4	5	6
LAB	A	8.8	6.6	7.4	7.2	7.3	7.6	7.2 6.9
RW	A	8.7	6.7	7.4	7.2	7.2	7.4	7.0
6.25%	A	8.7	6.6	7.8	7.3	7.9	7.5	6.9
12.5%	A	8.7	6.7	7.3	7.0	7.0	7.4	6.9
25%	A	9.0	6.4	7.3	6.9	6.9	7.4	6.9
50%	A	9.0	6.4	7.2	7.0	7.1	7.3	6.9
100%	A	8.7	6.8	7.2	6.9	7.3	7.2	6.9

NEW pH (SU)

0	1	2	3	4	5	6
8.10 ~~8.33~~	7.97	8.00	7.97	7.97	8.01	8.07
8.33	8.25	8.27	8.28	8.19	8.21	8.16
8.34	8.27	8.29	8.30	8.19	8.22	8.17
8.29	8.27	8.29	8.28	8.19	8.22	8.17
8.26	8.24	8.28	8.27	8.19	8.20	8.15
8.26	8.20	8.25	8.24	8.17	8.18	8.13
8.20	8.16	8.19	8.16	8.13	8.12	8.09

SALINITY (PPT)

CONC	REP	0	1	2	3	4	5	6
LAB	A	26	26	24	25	25	24	23
RW	A	25	25	24	24	25	25	25
6.25%	A	25	25	24	24	26	25	25
12.5%	A	24	25	25	24	25	25	25
25%	A	25	25	25	24	25	25	25
50%	A	25	25	25	24	25	25	26
100%	A	24	25	25	25	26	26	26
INC TEMP		25	25	25	25	25	25	25
DATE:		09/22/15	9/23/15	9/24	9/25	9/26	09/27	09/28
TIME:		1510	1320	1110	1125	1040	1145	1515
INITIALS:		EH	EB	NP	NP	NP	EH	HK

NEW TEMPERATURE (°C)

0	1	2	3	4	5	6
22	22	22	22	21	20	23
24	21	24	24	24	21	23
24	22	24	24	23	21	23
23	22	24	24	24	21	23
23	22	24	25	23	21	24
22	22	24	25	22	21	24
22	23	24	25	21	21	23

	DAY 0 (START)							DAY 2 (1ST RENEWAL)				DAY 4 (2ND RENEWAL)			
	METALS	TOC	ALK	HARD	AMM	TS/TDS	TRC	ALK	HARD	AMM	TRC	ALK	HARD	AMM	TRC
EFF							<0.02				<0.02				<0.02
RW							<0.02				<0.02				<0.02

Did 1st Renewal sample cause ≥50% mortality? Yes ____ No X
If "YES" put into circulation TOC and METALS bottles. ____

Did 2nd Renewal sample cause ≥50% mortality? Yes ____ No X
If "YES" put into circulation TOC and METALS bottles. ____

M. Beryllina CHRONIC ASSAY - OLD WATER QUALITIES

STUDY: 26494	CLIENT: ESS Laboratories	SAMPLE: Effluent	DILUENT: RW

OLD Temperature (°C)

CONC	REP	1	2	3	4	5	6	7
LAB	A	24	23	23	23	21	24	24
RW	A (E3) NP 9/23	24	~~23~~ 25	23	23	21	24	24
6.25%	A	24	23	23	23	22	24	24
12.5%	A	24	23	23	23	22	24	24
25%	A	24	23	23	23	22	24	24
50%	A	24	23	23	23	22	24	24
100%	A	24	24	23	23	22	24	24

OLD pH (SU)

CONC	REP	1	2	3	4	5	6	7
LAB	A	7.89	7.90	7.69	7.74	7.81	7.77	7.89
RW	A	8.21	8.15	8.10	8.11	8.15	8.05	8.10
6.25%	A	8.22	8.18	8.11	8.10	8.13	8.03	8.09
12.5%	A	8.23	8.25	8.12	8.09	8.10	8.07	8.11
25%	A	8.19	8.18	8.12	8.09	8.10	8.04	8.08
50%	A	8.17	8.15	8.10	8.10	8.06	8.01	8.06
100%	A	8.12	8.06	8.07	8.09	8.01	7.95	7.97

OLD SALINITY (PPT)

CONC	REP	1	2	3	4	5	6	7
LAB	A	26	26	24	25	25	25	22
RW	A	25	25	24	25	26	26	25
6.25%	A	25	25	24	25	26	26	25
12.5%	A	24	25	24	24	25	26	26
25%	A	25	25	25	24	26	26	25
50%	A	25	25	25	25	26	26	26
100%	A	25	25	25	24	26	26	26

INC TEMP:		25	25	25	25	25	25	25
DATE:		9/23	9/24	9/25	9/26	09/27	09/28	9/29
TIME:		0850	0940	0915	0930	0855	1335	0855
INITIALS:		NP	NP	BL	BL	EH	HK	NP

PREPARATION of DILUTIONS

STUDY: ZC494 CLIENT: ESS Laboratories SAMPLE: Effluent - Kendall Station

SPECIES: *M. beryllina* TEST: chronic renewal DILUENT: Receiving Water

START Diluent: RW Concentration	Day: 0 Sample: E_0, D_0		Day: 1 Sample: E_0, D_0	
	Vol Eff	Final Vol	Vol Eff	Final Vol
Lab	0	2000	0	1000
RW	0		0	
6.25%	125		62.5	
12.5%	250		125	
25%	500		250	
50%	1000		500	
100%	2000		1000	

	Date	Time	Init	Brine Shrimp
Day 0	09/22/15	1450	EH	A-4046
Day 1	09/23/15	1300	EB	A-4046
Day 2	9/24/15	1055	NP	A-4064
Day 3	9/25/15	1105	NP	A-4064
Day 4	09/26	1030	NP	A-4064
Day 5	09/27	1140	EH	A-4064
Day 6	09/28	1430	HK	A-4064

1st Renewal Diluent: RW Concentration	Day: 2 Sample: E_1, D_1		Day: 3 Sample: E_1, D_1		Day: Sample:	
	Vol Eff	Final Vol	Vol Eff	Final Vol	Vol Eff	Final Vol
Lab	0	1600	0	1600		
RW	0		0			
6.25%	100		100			
12.5%	200		200			
25%	400		400			
50%	800		800			
100%	1600		1600			

Lab Water ID:	
Day 0	26435
Day 1	26435
Day 2	26435
Day 3	26435
Day 4	26435
Day 5	26435
Day 6	26435 ~~VK~~ HK (E3) 9/28

2nd Renewal Diluent: RW Concentration	Day: 4 Sample: E_2, D_2		Day: 5 Sample: E_2, D_2		Day: 6 Sample: E_2, D_2	
	Vol Eff	Final Vol	Vol Eff	Final Vol	Vol Eff	Final Vol
Lab	0	1600	0	1600	0	1600
RW	0		0		0	
6.25%	100		100		100	
12.5%	200		200		200	
25%	400		400		400	
50%	800		800		800	
100%	1600		1600		1600	

PREPARATION OF DILUTIONS

STUDY: 26633	CLIENT: ESS Laboratories	
SPECIES: *A. punctulata*		
Diluent: (E3) 30ppt Lab Salt ~~Receiving Water~~	Day: 0 Start	
Concentration %	Vol. Eff.(mls)	Final Vol.(mls)
Lab Salt	0	100
RW	0	↓
6.25%	6.25	
12.5%	12.5	
25%	25	
50%	50	
100%	100	↓
INITIALS:	[illegible]	
TIME:	1415	
DATE:	10/16/15	

RW = Receiving Water

METER USE RECORD
MARINE CHRONIC
M. beryllina

STUDY: Z6494	CLIENT: ESS Laboratories	SAMPLE: Effluent - Kendall Station

OLD WATER QUALITIES - *M. beryllina*

	0	1	2	3	4	5	6	7	8
Water Quality Station #		1	1	1	1	1	1	1	
Initials		NP	NP	BL	BL	EH	~~NP~~ HK HK (E3) EH 09/29	NP	

NEW WATER QUALITIES - *M. beryllina*

	0	1	2	3	4	5	6	7	8
Water Quality Station #	2	2	2	2	2	1	1		
Initials	EH	EB ~~NP~~	NP	NP	NP	EH	Z HK		
Date	09/22/15	9/23	9/24	9/25	9/26	09/27	09/28	09/29	

(E3) NP 9/29

(E3) EH 09/29

Water Quality Station #1		Water Quality Station #2		COMMENTS
DO meter #	24	DO meter #	23	
DO probe #	94	DO probe #	93	
pH meter #	1097	pH meter #	470	
pH probe #	137	pH probe #	136	
S/C meter #	YSI30E	S/C meter #	YSI30E	
S/C probe #	↓	S/C probe #	↓	

SAMPLE RECEIPT RECORD
FOR CHRONIC TOXICITY EVALUATIONS

STUDY #: 26494	CLIENT: ESS Laboratory

SAMPLE RECEIPT INFORMATION

	Start Sample	First Renewal	Second Renewal
Sample Receipt Date & Time:	09/21/15 1455	09/23/15 1340	9/25/15 ~~1555~~ 1105
Received By:	PK	RM	~~BC~~ VL
Delivered Via:	Fed Ex UPS (Client) Courier (ESI)	Fed Ex UPS (Client) Courier (ESI)	Fed Ex UPS Client Courier (ESI)
Logged Into Lab By:	EH	NP	BC
Date &Time Logged In:	09/21/15 1510	09/23/15 1440	9/25/15 (1455)

SAMPLE CONDITION INFORMATION

Chain of Custody?	(Yes) or No	(Yes) or No	(Yes) or No
Chain of Custody Signed?	(Yes) or No	(Yes) or No	(Yes) or No
Chain of Custody Complete?	(Yes) or No	(Yes) or No	(Yes) or No
Sample Date?	(Yes) or No	(Yes) or No	(Yes) or No
Sample Time?	(Yes) or No	(Yes) or No	(Yes) or No
Sample Type?	(Yes) or No	(Yes) or No	(Yes) or No
Custody Seal in Place?	Yes (NA) No	Yes (NA) No	Yes (NA) No
Shipping Container Intact?	(Yes) or No	(Yes) or No	(Yes) or No
Temp Blank Temperature:	4.0°C	1.2°C	1°C
DOES CLIENT NEED NOTIFICATION OF TEMP?	Yes or (No)	Yes or (No)	Yes or (No)
Sample Arrived on Ice?	(Yes) or No	(Yes) or No	(Yes) or No
COMMENTS:	See COC	See COC	See COC

P:\GENERAL PROJECTS\FORMS\LABFORMS\Sample Receipt Record - Chronic 2013.wpd

SAMPLE RECEIPT AND CONDITION DOCUMENTATION

STUDY NO:	26633		
SDG No:			
Project:	Kendall		
Delivered via:	Client		
Date and Time Received:	10/16/15 1315	Date and TIme Logged into Lab:	10/16/15 1340
Received By:	KC	Logged into Lab by:	KC
Air bill / Way bill:	No	Air bill included in folder if received?	NA
Cooler on ice/packs:	Yes	Custody Seals present?	NA
Cooler Blank Temp (C) at arrival:	2	Custody Seals intact?	NA
Number of COC Pages:	1		
COC Serial Number(s):	NA		
COC Complete:	Yes	Does the info on the COC match the samples?	Yes
Sampled Date:	Yes	Were samples received within holding time?	Yes
Field ID complete:	Yes	Were all samples properly labeled?	Yes
Sampled Time:	Yes	Were proper sample containers used?	Yes
Analysis request:	Yes	Were samples received intact? (none broken or leaking)	Yes
COC Signed and dated:	Yes	Were sample volumes sufficient for requested analysis?	Yes
Were all samples received?	Yes	Were VOC vials free of headspace?	NA
Client notification/authorization:	Not required	pH Test strip ID number:	

Field ID	Lab ID	Mx	Analysis Requested	Bottle	Req'd Pres'n	Verified Pres'n
Effluent Start	26633-001	W	AP01CR - Retest	1x3750 mL	4C	
Receiving Water Start	26633-002	W	AP01CR - Retest	1x3750 mL	4C	

Notes and qualifications:

See COC

ESI EnviroSystems, Inc.
1 Lafayette Road
Hampton, NH 03842

Voice: 603-926-3345
FAX: 603-926-3521

ESI Job No: 26494

CHAIN OF CUSTODY DOCUMENTATION

Client: ESS Laboratory	Contact: Joe Sirbak	Project Name: ESS Laboratory - Kendall Station	
Report to: Joe Sirbak	Address: 5 Avenue D	Project Number: P0604	Task: 0001
Invoice to: Joe Sirbak	Address: Hopkinton, MA 01748	Project Manager: Joe Sirbak	
Voice: 508-435-9244 x4720	Fax: 508-435-9912	email: Jsirbak@thielsch.com	ERR

Protocol: NPDES

Lab Number (assigned by lab)	Your Field ID: (must agree with container)	Date Sampled	Time Sampled	Sampled By	Grab or com-posite (G/C)	Container No	Container Size (mL)	Container Type (P/G/T)	Field Preser-vation	Matrix S=Solid W=Water	Filter N=Not needed F=Done in field L=Lab to do	Analyses Requested\ Special Instructions:
001	Effluent Start	09/20/15 - 09/21/15	0800 - 0800	MNM	C	3	3750	P	4 C	Water	N	MB7DCR; APO1CR ~~CDPP7DCR~~ StartSample
002	Receiving Water Start	09/21/15	1300		G	3	3750	P	4 C	Water	N	~~CDPP7DCR~~ StartDiluent @EH 09/21

Relinquished By: [signature] Date: 9/21/15 Time: 1455

Received By: P. Veeb Date: 9/21/15 Time: 2:55 PM

Relinquished By: Date: Time:

Received at Lab By: Date: Time:

Comments: Marine chronic assays will be conducted if effluent PPT is >1 at time of collection.

4.0°C

COC Number: A1012420

Sample Delivery Group No: Sept 2015

Page of

ESI

EnviroSystems, Inc.
1 Lafayette Road
Hampton, NH 03842

Voice: 603-926-3345
FAX: 603-926-3521

ESI Job No: 26494

CHAIN OF CUSTODY DOCUMENTATION

Client: ESS Laboratory	Contact: Joe Sirbak	Project Name: ESS Laboratory - Kendall Station	
Report to: Joe Sirbak	Address: 5 Avenue D	Project Number: P0604	Task: 0001
Invoice to: Joe Sirbak	Address: Hopkinton, MA 01748	Project Manager: Joe Sirbak	
Voice: 508-435-9244 x4720	Fax: 508-435-9912	email: Jsirbak@thielsch.com	ERR

Protocol: NPDES

Lab Number (assigned by lab)	Your Field ID: (must agree with container)	Date Sampled	Time Sampled	Sampled By	Grab or composite (G/C)	Container No	Container Size (mL)	Container Type (P/G/T)	Field Preservation	Matrix S=Solid W=Water	Filter N=Not needed F=Done in field L=Lab to do	Analyses Requested\ Special Instructions:
003	Effluent First Renewal	9/22-9/23	0800 0800	MNM	G/C	3	3750	P	4 C	Water	N	CDPP7DCR 1stRenewal Sample
004	Receiving Water First Renewal	9/23/15	1100	MNM	G	5 3 MNM	3750	P	4 C	Water	N	CDPP7DCR 1stRenewal Diluent

Relinquished By:	Date: 9/23/15 Time: 1340	Received By:	Date: Time:
Relinquished By:	Date: Time:	Received at Lab By: Renee Michaud	Date: 09/23/15 Time: 1340

Comments: Marine chronic assays will be conducted if effluent PPT is >1 at time of collection.

1.2°C RW received in wrong sub-lab - labeled as 2nd renewal

COC Number: A1012421

Sample Delivery Group No: Sept 2015

Page of

ESI

EnviroSystems, Inc.
1 Lafayette Road
Hampton, NH 03842

Voice: 603-926-3345
FAX: 603-926-3521

ESI Job No: 26494

CHAIN OF CUSTODY DOCUMENTATION

Client: ESS Laboratory	Contact: Joe Sirbak	Project Name: ESS Laboratory - Kendall Station	
Report to: Joe Sirbak	Address: 5 Avenue D	Project Number: P0604	Task: 0001
Invoice to: Joe Sirbak	Address: Hopkinton, MA 01748	Project Manager: Joe Sirbak	
Voice: 508-435-9244 x4720	Fax: 508-435-9912	email: Jsirbak@thielsch.com	ERR

Protocol: NPDES

Lab Number (assigned by lab)	Your Field ID: (must agree with container)	Date Sampled	Time Sampled	Sampled By	Grab or composite (G/C)	Container No	Container Size (mL)	Container Type (P/G/T)	Field Preservation	Matrix S=Solid W=Water	Filter N=Not needed F=Done in field L=Lab to do	Analyses Requested\ Special Instructions:
005	Effluent Second Renewal	9/24/15 9/25/15	0800 0800	MNM	C	3	3750	P	4 C	Water	N	CDPP7DCR 2ndRenewal Sample
006	Receiving Water Second Renewal	9/25/15	0855	MNM	G	5 MNM	3750	P	4 C	Water	N	CDPP7DCR 2ndRenewal Diluent

Relinquished By:	Date: 9/25/15 Time: 1105	Received By: Rich Tracy	Date: 9/25/15 Time: 1105
Relinquished By:	Date: Time:	Received at Lab By:	Date: Time:

Comments: Marine chronic assays will be conducted if effluent PPT is >1 at time of collection.

10C

COC Number: A1012422

Sample Delivery Group No: Sept 2015	Page of

ESI
EnviroSystems, Inc.
1 Lafayette Road
P.O. Box 778
Hampton, N.H. 03843
Voice: 603-926-3345
FAX: 603-926-3521

ESI Job No: Z6633

CHAIN OF CUSTODY DOCUMENTATION

Client: ESS Lab	Contact:	Project Name: Kendall	Page 1 of 1
Report to: Joe Sirbak / Matt Miller	Address:	Project Number:	
Invoice to:	Address:	Project Manager:	
Voice:	Fax:	email:	P.O. No: Quote No:

Protocol: RCRA SDWA NPDES USCOE Other

Lab Number (assigned by lab)	Your Field ID: (must agree with container)	Date Sampled	Time Sampled	Sampled By	Grab or com-posit (G/C)	Container Size (ml.)	Container Type (P/G/T)	Field Preser-vation	Matrix S=Solid W=Water	Filter N=Not needed F=Done in field L=Lab to do	Analyses Requested\ Special Instructions:
001	Final Effluent	10/15/15 -10/16/15	1145-1145	MWM	C	1GAL	P	4°C	W	N	APOICR - Retest
002	Rec. Water	10/16/15	1130	MWM	G	1GAL	P	4°C	W	N	APOICR - Retest

Relinquished By: Date: 10/16/15 Time: 1315 Received By: Date: 10/16/15 Time: 1315

Relinquished By: Date: Time: Received at Lab By: Date: Time:

Comments: 2°C

Sample Delivery Group No: Page of

Assay Review Checklist

DATE IN: 09/21/15 **STUDY#:** 26494

DATE DUE: _____ **CLIENT:** ESS Laboratories

_____ **PROJECT:** _____

ASSAY: MB7DCR, AP01CR

Project Paperwork Check for Completeness			
	Date	**Initials**	**Comments**
Day 0	09/22/15	EH	
Day 1	09/23	EB	
Day 2	9/24/15	NP	
Day 3	9/25/15	NP	Previous ARC sheet missing - please fill in initials.
Day 4	9/26/15	NP	
Day 5	09/27	EH	
Day 6	09/28	HK	
Day 7	09/29	EH	
Day 8			

Analyst Data Review	Date	Initials	Comments
Chains of Custody Complete	10/07/15	EH	
Sample Receipt Complete	↓	↓	
Organism Culture Sheet(s)			
Bench Sheets Complete (dates, times, initials, etc...)			
Water Quality Data Complete			
TRC Values & Bottle Numbers	↓		
Daphnid Calculations Complete	NA		
Weights Reported	10/07/15		
Assay Acceptability Review	↓	↓	

Technical Report Review	Date	Initials	Comments
Statistical Analysis Complete	10/12/15	KC (NR)	10/21 reprinted (NR) w/ correct source info
Statistical Analysis Reviewed	10/15/15	UB	
Data Acceptability Review	10/12/15	KC (NR)	
Supporting Chemistry Report	N/A		
Draft Report	10/21/15	UB	
QA Audit/Review Complete			
Final Report Reviewed	10/22/15	NR	
Final Report Printed - PDF	↓	↓	
Executive Summary / Chems Sent	10/19/15	UB	emailed exec sum. & cover letter
Report E-mailed / Faxed	10/22/15	NR	
Report Logged Out / Invoice Sent	↓	↓	
Report Scanned to Archive			

Assay Review Checklist

DATE IN: 10/16/15 **STUDY#:** 26633

DATE DUE: 10/30/15 **CLIENT:** ESS Laboratories

PROJECT:

ASSAY: APOCR retest

Project Paperwork Check for Completeness			
	Date	**Initials**	**Comments**
Day 0	10/16/15	UB	
Day 1	10/17	EH	
Day 2	10/18	EH	
Day 3	10/19	EH	
Day 4			
Day 5			
Day 6			
Day 7			
Day 8			

Analyst Data Review	Date	Initials	Comments
Chains of Custody Complete	10/19/15	EH	
Sample Receipt Complete	↓	↓	
Organism Culture Sheet(s)	NA		
Bench Sheets Complete (dates, times, initials, etc...)	10/19/15		
Water Quality Data Complete	↓		
TRC Values & Bottle Numbers	↓		
Daphnid Calculations Complete	NA		
Weights Reported	NA		
Assay Acceptability Review	10/19/15	↓	

Technical Report Review	Date	Initials	Comments
Statistical Analysis Complete	10/20/15	NR	10/21 reprinted (ME) w/ correct client info
Statistical Analysis Reviewed	10/21/15	UB	
Data Acceptability Review	10/20/15	NR	Ap-non-std dose-resp w/ sig eff or lent in 25% +100% [ ]s w/ calc
Supporting Chemistry Report	N/A		E. NOEC = 12.5%. All TAC were met
Draft Report	10/21/15	UB	+IC25 = 55.1%. this evidence supports a C-NOEC = 50%
QA Audit/Review Complete			
Final Report Reviewed	10/22/15	NR	
Final Report Printed - PDF	↓	↓	
Executive Summary / Chems Sent			
Report E-mailed / Faxed	10/22/15	NR	
Report Logged Out / Invoice Sent	↓	↑	
Report Scanned to Archive	↓	↓	

P:\GENERAL PROJECTS\FORMS\LABFORMS\$ Assay Review Checklist.wpd

Non-Compliant Bench Sheets and Data

A. punctulata assay
Started September 24, 2015

Total Pages (Including this Page) = 7

Arbacia punctulata Chronic Fertilization Assay

STUDY:	CLIENT:	SAMPLE/DILUENT:	DATE: 09/24/15
20H94	ESS Laboratories	EFFLUENT/RECEIVING WATER	INITIALS: EH

SALINITY ADJUSTMENT RECORD: 1000 ml EFFLUENT + 33 g SALT = (A-3969) 100% ACTUAL PERCENTAGE

SALINITY ADJUSTMENT RECORD: 1000 ml DILUENT + 33 g SALT = 100% ACTUAL PERCENTAGE

EFFLUENT CONCENTRATION)	D.O. (mg/L)	pH (SU)	TEMPERATURE (°C)	SALINITY (ppt)	TRC (mg/L)
"AS RECEIVED" EFFLUENT	6.8	7.63		1.4	<0.02
"AS RECEIVED" Receiving Water	7.7	8.60		1.5	<0.02
LAB SALT	8.5	8.07	21	30	<0.02
RECEIVING WATER	8.9	8.13	20	30	
6.25%	9.1	8.31	20	30	
12.5%	9.2	8.31	20	30	
25%	9.1	8.31	20	29	
50%	9.1	8.29	20	29	
100%	9:1	8.25	21	30	

INCUBATOR TEMP °C:	25
DATE:	09/24/15
TIME:	0935
INITIALS:	EH

SPERM DILUTIONS:

HEMACYTOMETER COUNT, E: 110 X 10^4 = SPM SOLUTION D = 1.10×10^6

SPERM CONCENTRATIONS:
SOLUTION E X 40 = SOLUTION A = 4.40×10^7 SPM
SOLUTION E X 20 = SOLUTION B = 2.20×10^7 SPM
SOLUTION E X 5 = SOLUTION C = 5.50×10^6 SPM

FINAL COUNTS:

FINAL SPERM COUNT: 4.40×10^7
FINAL EGG COUNT: 2200

ORGANISM LOT: _____

TEST TIMES:

STATION #: 2

SPERM COLLECTED: 1315
EGGS COLLECTED: 1315
SPERM ADDED: 1340
EGGS ADDED: 1440
FIXATIVE ADDED: 1500

Arbacia punctulata Chronic Fertilization Assay

STUDY: Z6494	CLIENT: ESS Laboratories	SAMPLE/DILUENT: EFFLUENT / RECEIVING WATER	DATE: 9/24/15 TIME: 0830 INITIALS: LB

EFFLUENT CONC.	REPLICATE VIAL			
	1 UNFERT/TOTAL	2 UNFERT/TOTAL	3 UNFERT/TOTAL	4 UNFERT/TOTAL
LAB SALT	69/102	69/107	83/100	83/103
RW	62/111	68/107	63/117	73/125
6.25%	64/108	50/111	53/103	68/116
12.5%	34/111	57/127	40/101	42/103
25%	18/118	16/117	17/133	22/122
50%	12/111	3/108	8/101	10/111
100%	1/105	0/106	2/102	3/105

Arbacia Sperm Cell Fertilization Test — **EnviroSystems, Inc.**

Batch ID:	05-4510-6670	**Test Type:**	Fertilization	**Analyst:**	Kirk Cram
Start Date:	24 Sep-15 13:40	**Protocol:**	EPA/821/R-02-014 (2002)	**Diluent:**	Laboratory Seawater
Ending Date:	24 Sep-15 15:00	**Species:**	Arbacia punctulata	**Brine:**	Generic commercial salts
Duration:	80m	**Source:**	In-House Culture	**Age:**	

Sample ID:	04-9860-7300	**Code:**	26494	**Client:**	ESS Laboratory
Sample Date:	23 Sep-15 08:00	**Material:**	Power Plant Effluent	**Project:**	Third Quarter WET Compliance Test
Receipt Date:	23 Sep-15 13:40	**Source:**	ESS Laboratory		
Sample Age:	30h (1 °C)	**Station:**	Kendall Green Energy (MA0004898)		

Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	NOEL	LOEL	TOEL	TU	PMSD
00-2305-5405	Proportion Fertilized	Dunnett Multiple Comparison Test	6.25	12.5	8.839	16	16.6%

Test Acceptability

				TAC Limits			
Analysis ID	**Endpoint**	**Attribute**	**Test Stat**	**Lower**	**Upper**	**Overlap**	**Decision**
00-2305-5405	Proportion Fertilized	Control Resp	0.579	0.7	1	Yes	Below Acceptability Criteria
00-2305-5405	Proportion Fertilized	PMSD	0.166	0	0.25	Yes	Passes Acceptibility Criteria

Proportion Fertilized Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LS	4	0.739	0.593	0.886	0.645	0.830	0.046	0.092	12.48%	0.00%
0	RW	4	0.579	0.512	0.646	0.538	0.636	0.021	0.042	7.24%	21.66%
6.25		4	0.536	0.429	0.643	0.450	0.593	0.034	0.067	12.52%	27.50%
12.5		4	0.390	0.294	0.485	0.306	0.449	0.030	0.060	15.41%	47.28%
25		4	0.149	0.113	0.186	0.128	0.180	0.012	0.023	15.42%	79.80%
50		4	0.076	0.021	0.131	0.028	0.108	0.017	0.035	45.18%	89.68%
100		4	0.014	0.000	0.034	0.000	0.029	0.006	0.012	85.75%	98.05%

Proportion Fertilized Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	LS	0.676	0.645	0.830	0.806
0	RW	0.559	0.636	0.538	0.584
6.25		0.593	0.450	0.515	0.586
12.5		0.306	0.449	0.396	0.408
25		0.153	0.137	0.128	0.180
50		0.108	0.028	0.079	0.090
100		0.010	0.000	0.020	0.029

Arbacia Sperm Cell Fertilization Test — **EnviroSystems, Inc.**

Analysis ID:	00-2305-5405	**Endpoint:**	Proportion Fertilized	**CETIS Version:**	CETISv1.9.0
Analyzed:	12 Oct-15 11:26	**Analysis:**	Parametric-Control vs Treatments	**Official Results:**	Yes
Sample ID:	04-9860-7300	**Code:**	26494	**Client:**	ESS Laboratory
Sample Date:	23 Sep-15 08:00	**Material:**	Power Plant Effluent	**Project:**	Third Quarter WET Compliance Test
Receipt Date:	23 Sep-15 13:40	**Source:**	ESS Laboratory		
Sample Age:	30h (1 °C)	**Station:**	Kendall Green Energy (MA0004898)		

Data Transform	Alt Hyp	Trials	Seed	TST b	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)	C > T	n/a	n/a	n/a	6.25	12.5	8.839	16	16.6%

Dunnett Multiple Comparison Test

Control	vs	Conc-%	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Receiving Water		6.25	1.08	2.41	0.097	6	CDF	0.3865	Non-Significant Effect
		12.5*	4.76	2.41	0.097	6	CDF	3.7E-04	Significant Effect
		25*	11.7	2.41	0.097	6	CDF	2.7E-05	Significant Effect
		50*	14.7	2.41	0.097	6	CDF	2.7E-05	Significant Effect
		100*	18.7	2.41	0.097	6	CDF	2.7E-05	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	1.89802	0.379603	5	117	<1.0E-37	Significant Effect
Error	0.058331	0.003241	18			
Total	1.95635		23			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	2.27	15.1	0.8108	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.927	0.884	0.0821	Normal Distribution

Proportion Fertilized Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	RW	4	0.579	0.512	0.646	0.571	0.538	0.636	0.021	7.24%	0.00%
6.25		4	0.536	0.429	0.643	0.550	0.450	0.593	0.034	12.52%	7.46%
12.5		4	0.390	0.294	0.485	0.402	0.306	0.449	0.030	15.41%	32.70%
25		4	0.149	0.113	0.186	0.145	0.128	0.180	0.012	15.42%	74.21%
50		4	0.076	0.021	0.131	0.085	0.028	0.108	0.017	45.18%	86.83%
100		4	0.014	0.000	0.034	0.015	0.000	0.029	0.006	85.75%	97.51%

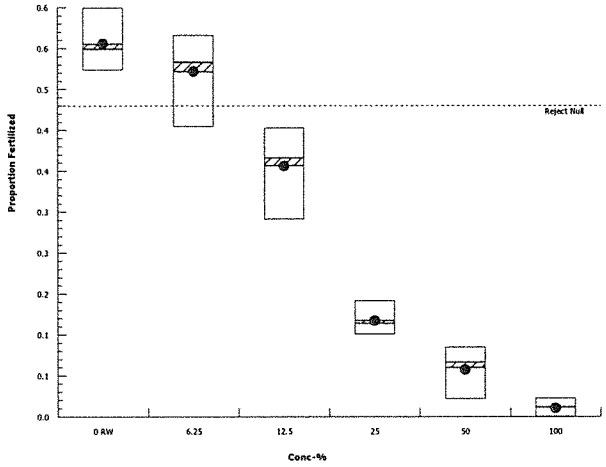
Angular (Corrected) Transformed Summary

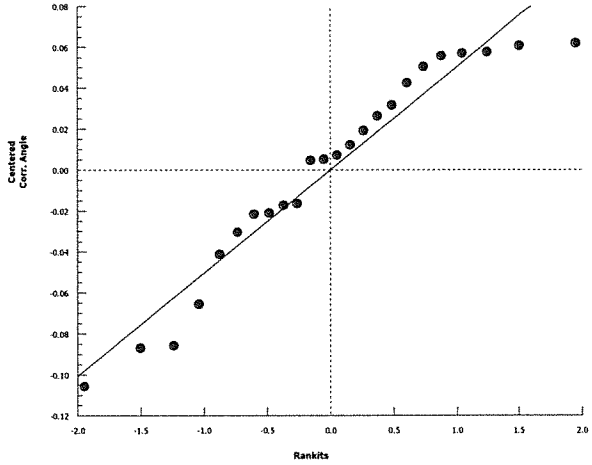
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	RW	4	0.865	0.797	0.933	0.857	0.824	0.923	0.021	4.94%	0.00%
6.25		4	0.822	0.714	0.929	0.836	0.736	0.879	0.034	8.20%	5.03%
12.5		4	0.673	0.574	0.773	0.687	0.587	0.734	0.031	9.26%	22.15%
25		4	0.396	0.345	0.447	0.390	0.366	0.439	0.016	8.06%	54.22%
50		4	0.273	0.156	0.390	0.295	0.167	0.335	0.037	26.86%	68.43%
100		4	0.114	0.030	0.198	0.119	0.049	0.170	0.026	46.25%	86.80%

Arbacia Sperm Cell Fertilization Test — **EnviroSystems, Inc.**

Analysis ID:	00-2305-5405	**Endpoint:**	Proportion Fertilized	**CETIS Version:**	CETISv1.9.0
Analyzed:	12 Oct-15 11:26	**Analysis:**	Parametric-Control vs Treatments	**Official Results:**	Yes

Graphics





PREPARATION OF DILUTIONS

STUDY: Z6494	CLIENT: ESS Laboratories	
SPECIES: *A. punctulata*		
Diluent: Receiving Water	Day: 0 Start	
Concentration %	Vol. Eff.(mls)	Final Vol.(mls)
Lab Salt	0	100
RW	0	↓
6.25%	6.25	↓
12.5%	12.5	↓
25%	25	↓
50%	50	↓
100%	100	↓
INITIALS:	EH	
TIME:	0925	
DATE:	09/24/15	

RW = Receiving Water

ESS Laboratory

Division of Thielsch Engineering, Inc.

185 Frances Avenue,Cranston RI 02910-2211
Tel. (401)461-7181 Fax (401)461-4486
www.esslaboratory.com

CHAIN OF CUSTODY

ESS Lab # 1509587

Turn Time ___X___Standard Other_____

Regulatory State: **MA** RI CT NH NJ NY ME Other_____

Is this project for any of the following:(please circle)
MA-MCP Navy USACE CT DEP Other_____

Reporting Limits - _____NPDES_____

Electonic Deliverables Excel Access PDF

Co. Name: **Veolia Kendall**	Project #:	Project Name: **NPDES BIOASSAY**	
Contact Person: **James Harrison**	Proj. Location:		
Address: **265 First St.**	City , State: **Cambridge, MA**	2142	PO #
Tel. 617-679-4803	email: James.harrison2@veolia___		

ESS Lab ID	Date	Collection Time	Grab -G Composite-C	Matrix	Sample ID	Pres Code	# of Containers	Type of Container	Vol of Container	Analysis: Total Solids	Suspended Solids	Alkalinity	Specific Conductance	Ammonia	TOC	Cd, Cr, Pb, Cu, Zn, Ni, Al, Mg, Ca	Hardness	
1	9/21/15	1300	Grab	SW	Receiving Water	1	1	p	1000ML	X	X	X	X					
1	9/21/15	1300	Grab	SW	Receiving Water	3	1	P	500ML					X				
1	9/21/15	1300	Grab	SW	Receiving Water	3	2	V	40ML						X			
1	9/21/15	1300	Grab	SW	Receiving Water	4	1	P	500ML							X	X	

Container Type: P-Poly G-Glass AG-Amber Glass S-Sterile V-VOA

Matrix: S-Soil SD-Solid D-Sludge WW-Wastewater GW-Groundwater SW-Surface Water DW-Drinking Water O-Oil W-Wipes F-Filter

Cooler Present ____x___Yes _____No

Seals Intact ____Yes _____No NA:_x___

Cooler Temperature: 5.2° ICE IR 9/22/15

Internal Use Only

[ ] Pickup

[x] Technician_MM__

Preservation Code: 1-NP, 2-HCl, 3-H2SO4, 4-HNO3, 5-NaOH, 6-MeOH, 7-Asorbic Acid, 8-ZnAct, 9-_____

Sampled by : **Matt Miller-ESS Laboratory**

Comments: **SEE ATTACHED SHEET FOR LIMITS**
pH: 7.82 s.u. @ 23.4C
Salinity: 1.1 PPT
TRC: 0.09
Diss. Oxygen: 6.81 mg/L

Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)	Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)
1915 9/21/15	9/21/15		
Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)	Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)

* By circling MA-MCP, client acknowledges sampels were collected in accordance with MADEP CAM VIIA

Please fax to the laboratory all changes to Chain of Custody

Report Method Blank & Laboratory Control Sample Results

ESS Laboratory

Division of Thielsch Engineering, Inc.

185 Frances Avenue,Cranston RI 02910-2211
Tel. (401)461-7181 Fax (401)461-4486
www.esslaboratory.com

CHAIN OF CUSTODY

ESS Lab # 1509569

Turn Time ___X___Standard Other_____

Regulatory State: **MA** RI CT NH NJ NY ME Other_____

Is this project for any of the following:(please circle)
MA-MCP Navy USACE CT DEP Other_____

Reporting Limits - _____NPDES_____

Electonic Deliverables Excel Access PDF

Co. Name	Project #	Project Name
Veolia Kendall		NPDES BIOASSAY

Contact Person	Proj. Location
James Harrison	

Address	City , State		PO #
265 First St.	Cambridge, MA	2142	

Tel.	email:
617-679-4803	James.harrison2@veolia

ESS Lab ID	Date	Collection Time	Grab -G Composite-C	Matrix	Sample ID	Pres Code	# of Containers	Type of Container	Vol of Container	Analysis: Total Solids	Suspended Solids	Alkalinity	Specific Conductance	Ammonia	TOC	Cd, Cr, Pb, Cu, Zn, Ni, Al, Mg, Ca	Hardness
2	9/20/15 TO9/21/15	0800 TO 0800	Comp	WW	Final Effluent	1	1	p	1000ML	x	x	x	x				
2	9/20/15 TO9/21/15	0800 TO 0800	Comp	WW	Final Effluent	3	1	P	500ML					x			
2	9/20/15 TO9/21/15	0800 TO 0800	Comp	WW	Final Effluent	3	2	V	40ML						x		
2	9/20/15 TO9/21/15	0800 TO 0800	Comp	WW	Final Effluent	4	1	P	500ML							x	x

Container Type: P-Poly G-Glass AG-Amber Glass S-Sterile V-VOA

Matrix: S-Soil SD-Solid D-Sludge WW-Wastewater GW-Groundwater SW-Surface Water DW-Drinking Water O-Oil W-Wipes F-Filter

Cooler Present ____x___Yes _____No

Seals Intact ____ Yes _____No NA:_x___

Cooler Temperature: _____

Internal Use Only

[ ] Pickup

[x] Technician_MM__

Preservation Code: 1-NP, 2-HCl, 3-H2SO4, 4-HNO3, 5-NaOH, 6-MeOH, 7-Asorbic Acid, 8-ZnAct, 9-_____

Sampled by : **Matt Miller-ESS Laboratory**

Comments: **SEE ATTACHED SHEET FOR LIMITS**
pH: 8.04 s.u. @ 30.2C
Salinity: 1.2 PPT
TRC: 0.10
Diss. Oxygen: 6.01 mg/L

Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)	Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)
1915 9/21/15	9/21/15		
Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)	Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)

* By circling MA-MCP, client acknowledges sampels were collected in accordance with MADEP CAM VIIA

Please fax to the laboratory all changes to Chain of Custody

Report Method Blank & Laboratory Control Sample Results

1 of 3.

ESS Laboratory

Division of Thielsch Engineering, Inc.

185 Frances Avenue,Cranston RI 02910-2211
Tel. (401)461-7181 Fax (401)461-4486
www.esslaboratory.com

CHAIN OF CUSTODY

ESS Lab # 1509567

Turn Time ___X___Standard Other_____

Regulatory State: **MA** RI CT NH NJ NY ME Other_____

Is this project for any of the following:(please circle)
MA-MCP Navy USACE CT DEP Other_____

Reporting Limits - _____NPDES_____

Electonic Deliverables Excel Access PDF

Co. Name: **Veolia Kendall**	Project #:	Project Name: **NPDES BIOASSAY**	
Contact Person: **James Harrison**	Proj. Location:		
Address: **265 First St.**	City , State: **Cambridge, MA**	2142	PO #
Tel. 617-679-4803	email: James.harrison2@veolia		

ESS Lab ID	Date	Collection Time	Grab -G Composite-C	Matrix	Sample ID	Pres Code	# of Containers	Type of Container	Vol of Container	Analysis: Total Solids	Suspended Solids	Alkalinity	Specific Conductance	Ammonia	TOC	Cd, Cr, Pb, Cu, Zn, Ni, Al, Mg, Ca	Hardness	
3	9/23/15	1100	Grab	SW	Receiving Water	1	1	p	1000ML	x	x	x	x					
3	9/23/15	1100	Grab	SW	Receiving Water	3	1	P	500ML					x				
3	9/23/15	1100	Grab	SW	Receiving Water	3	2	V	40ML						x			
3	9/23/15	1100	Grab	SW	Receiving Water	4	1	P	500ML							x	x	

Container Type: P-Poly G-Glass AG-Amber Glass S-Sterile V-VOA

Matrix: S-Soil SD-Solid D-Sludge WW-Wastewater GW-Groundwater SW-Surface Water DW-Drinking Water O-Oil W-Wipes F-Filter

Cooler Present ____x___Yes _____No

Seals Intact ____ Yes _____No NA:_x___

Cooler Temperature: 5.4°C Ice Chem 9/23/15

Internal Use Only

[ ] Pickup

[x] Technician_MM

Preservation Code: 1-NP, 2-HCl, 3-H2SO4, 4-HNO3, 5-NaOH, 6-MeOH, 7-Asorbic Acid, 8-ZnAct, 9-_____

Sampled by : **Matt Miller-ESS Laboratory**

Comments: 1/0/4 Samples for analysis

SEE ATTACHED SHEET FOR LIMITS
pH: 7.61 s.u. @ 24.2C
Salinity: 1.2 PPT
TRC: 0.14
Diss. Oxygen: 7.76 mg/L

Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)	Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)
9/23/15 1840	9/23/15 1700		
Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)	Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)

* By circling MA-MCP, client acknowledges sampels were collected in accordance with MADEP CAM VIIA

Please fax to the laboratory all changes to Chain of Custody

Report Method Blank & Laboratory Control Sample Results

2 of 2

ESS Laboratory

Division of Thielsch Engineering, Inc.

185 Frances Avenue,Cranston RI 02910-2211
Tel. (401)461-7181 Fax (401)461-4486
www.esslaboratory.com

CHAIN OF CUSTODY

ESS Lab # 1509567

Turn Time ___X___Standard Other_____

Regulatory State: **MA** RI CT NH NJ NY ME Other_____

Is this project for any of the following:(please circle)
MA-MCP Navy USACE CT DEP Other_____

Reporting Limits - _____NPDES_____

Electonic Deliverables Excel Access PDF

Co. Name: **Veolia Kendall**	Project #:	Project Name: **NPDES BIOASSAY**	
Contact Person: **James Harrison**	Proj. Location:		
Address: **265 First St.**	City , State: **Cambridge, MA**	2142	PO #
Tel. 617-679-4803	email: James.harrison2@veolia		

ESS Lab ID	Date	Collection Time	Grab -G Composite-C	Matrix	Sample ID	Pres Code	# of Containers	Type of Container	Vol of Container	Analysis: Total Solids	Suspended Solids	Alkalinity	Specific Conductance	Ammonia	TOC	Cd, Cr, Pb, Cu, Zn, Ni, Al, Mg, Ca	Hardness	
4	9/22/15 TO9/23/15	0800 TO 0800	Comp	WW	Final Effluent	1	1	p	1000ML	X	X	X	X					
4	9/22/15 TO9/23/15	0800 TO 0800	Comp	WW	Final Effluent	3	1	P	500ML					X				
4	9/22/15 TO9/23/15	0800 TO 0800	Comp	WW	Final Effluent	3	2	V	40ML						X			
4	9/22/15 TO9/23/15	0800 TO 0800	Comp	WW	Final Effluent	4	1	P	500ML							X	X	

Container Type: P-Poly G-Glass AG-Amber Glass S-Sterile V-VOA

Matrix: S-Soil SD-Solid D-Sludge WW-Wastewater GW-Groundwater SW-Surface Water DW-Drinking Water O-Oil W-Wipes F-Filter

Cooler Present ____x___Yes _____No

Seals Intact ____ Yes _____No NA:_x___

Cooler Temperature: 5.4°C ice 9/23/15

Internal Use Only

[ ] Pickup

[x] Technician_MM__

Preservation Code: 1-NP, 2-HCl, 3-H2SO4, 4-HNO3, 5-NaOH, 6-MeOH, 7-Asorbic Acid, 8-ZnAct, 9-_____

Sampled by : **Matt Miller-ESS Laboratory**

Comments: R Hold Samples for analysis

SEE ATTACHED SHEET FOR LIMITS
pH: 7.35 s.u. @ 26.3C
Salinity: 1.4 PPT
TRC: 0.17
Diss. Oxygen: 6.50 mg/L

Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)	Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)
9/23/15 1840	9/23/15 1900		
Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)	Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)

* By circling MA-MCP, client acknowledges sampels were collected in accordance with MADEP CAM VIIA

Please fax to the laboratory all changes to Chain of Custody

Report Method Blank & Laboratory Control Sample Results

1 of 2

ESS Laboratory

Division of Thielsch Engineering, Inc.

185 Frances Avenue,Cranston RI 02910-2211
Tel. (401)461-7181 Fax (401)461-4486
www.esslaboratory.com

CHAIN OF CUSTODY

ESS Lab # 1509567

Turn Time ___X___Standard Other_____

Regulatory State: **MA** RI CT NH NJ NY ME Other_____

Is this project for any of the following:(please circle)
MA-MCP Navy USACE CT DEP Other_____

Reporting Limits - _____NPDES_____

Electonic Deliverables Excel Access PDF

Co. Name: **Veolia Kendall**	Project #:	Project Name: **NPDES BIOASSAY**	
Contact Person: **James Harrison**	Proj. Location:		
Address: **265 First St.**	City , State: **Cambridge, MA**	2142	PO #
Tel. 617-679-4803	email: James.harrison2@veolia___		

ESS Lab ID	Date	Collection Time	Grab -G Composite-C	Matrix	Sample ID	Pres Code	# of Containers	Type of Container	Vol of Container	Analysis: Total Solids	Suspended Solids	Alkalinity	Specific Conductance	Ammonia	TOC	Cd, Cr, Pb, Cu, Zn, Ni, Al, Mg, Ca	Hardness	
5	9/25/15	0855	Grab	SW	Receiving Water	1	1	p	1000ML	x	x	x	x					
5	9/25/15	0855	Grab	SW	Receiving Water	3	1	P	500ML					x				
5	9/25/15	0855	Grab	SW	Receiving Water	3	2	V	40ML						x			
5	9/25/15	0855	Grab	SW	Receiving Water	4	1	P	500ML							x	x	

Container Type: P-Poly G-Glass AG-Amber Glass S-Sterile V-VOA

Matrix: S-Soil SD-Solid D-Sludge WW-Wastewater GW-Groundwater SW-Surface Water DW-Drinking Water O-Oil W-Wipes F-Filter

Cooler Present ____x___Yes _____No

Seals Intact ____ Yes _____No NA:_x___

Cooler Temperature: 3.2°C ICE MMM 9/28/15

Internal Use Only

[ ] Pickup

[x] Technician_MM__

Preservation Code: 1-NP, 2-HCl, 3-H2SO4, 4-HNO3, 5-NaOH, 6-MeOH, 7-Asorbic Acid, 8-ZnAct, 9-_____

Sampled by : **Matt Miller-ESS Laboratory**

Comments: Please hold Samples for analysis

SEE ATTACHED SHEET FOR LIMITS
pH: 7.03 s.u. @ 22.2C
Salinity: 1.3 PPT
TRC: 0.17
Diss. Oxygen: 6.93 mg/L

Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)	Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)
9/28/15 1530	9/25/15 1624		
Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)	Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)

* By circling MA-MCP, client acknowledges sampels were collected in accordance with MADEP CAM VIIA

Please fax to the laboratory all changes to Chain of Custody

Report Method Blank & Laboratory Control Sample Results

ESS Laboratory

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Tel. (401)461-7181 Fax (401)461-4486
www.esslaboratory.com

CHAIN OF CUSTODY

ESS Lab # 1509567

Turn Time ___X___Standard Other_____

Regulatory State: **MA** RI CT NH NJ NY ME Other_____

Is this project for any of the following:(please circle)
MA-MCP Navy USACE CT DEP Other_____

Reporting Limits - _____NPDES_____

Electonic Deliverables Excel Access PDF

Co. Name: **Veolia Kendall**	Project #:	Project Name: **NPDES BIOASSAY**	
Contact Person: **James Harrison**	Proj. Location:		
Address: **265 First St.**	City , State: **Cambridge, MA**	2142	PO #
Tel. 617-679-4803	email: James.harrison2@veolia		

ESS Lab ID	Date	Collection Time	Grab -G Composite-C	Matrix	Sample ID	Pres Code	# of Containers	Type of Container	Vol of Container	Analysis: Total Solids	Suspended Solids	Alkalinity	Specific Conductance	Ammonia	TOC	Cd, Cr, Pb, Cu, Zn, Ni, Al, Mg, Ca	Hardness	
6	9/24/15 TO9/25/15	0800 TO 0800	Comp	WW	Final Effluent	1	1	p	1000ML	x	x	x	x					
6	9/24/15 TO9/25/15	0800 TO 0800	Comp	WW	Final Effluent	3	1	P	500ML					x				
6	9/24/15 TO9/25/15	0800 TO 0800	Comp	WW	Final Effluent	3	2	V	40ML						x			
6	9/24/15 TO9/25/15	0800 TO 0800	Comp	WW	Final Effluent	4	1	P	500ML							x	x	

Container Type: P-Poly G-Glass AG-Amber Glass S-Sterile V-VOA

Matrix: S-Soil SD-Solid D-Sludge WW-Wastewater GW-Groundwater SW-Surface Water DW-Drinking Water O-Oil W-Wipes F-Filter

Cooler Present ____x___Yes _____No

Seals Intact ____ Yes _____No NA:_x___

Cooler Temperature: _____

Internal Use Only

[ ] Pickup

[x] Technician_MM__

Preservation Code: 1-NP, 2-HCl, 3-H2SO4, 4-HNO3, 5-NaOH, 6-MeOH, 7-Asorbic Acid, 8-ZnAct, 9-_____

Sampled by : **Matt Miller-ESS Laboratory**

Comments: Please hold Samples for analysis

SEE ATTACHED SHEET FOR LIMITS
pH: 7.00 s.u. @ 31.1C
Salinity: 1.4 PPT
TRC: 0.19
Diss. Oxygen: 6.59 mg/L

Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)	Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)
9/28/15 1530	9/28/15 1624		
Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)	Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)

* By circling MA-MCP, client acknowledges sampels were collected in accordance with MADEP CAM VIIA

.Please fax to the laboratory all changes to Chain of Custody

Report Method Blank & Laboratory Control Sample Results

ESI

EnviroSystems, Inc.
1 Lafayette Road
Hampton, NH 03842

Voice: 603-926-3345
FAX: 603-926-3521

ESI Job No: 3 of 3 1509567

CHAIN OF CUSTODY DOCUMENTATION

Client: ESS Laboratory	Contact: Joe Sirbak	Project Name: ESS Laboratory - Kendall Station	
Report to: Joe Sirbak	Address: 5 Avenue D	Project Number: P0604	Task: 0001
Invoice to: Joe Sirbak	Address: Hopkinton, MA 01748	Project Manager: Joe Sirbak	
Voice: 508-435-9244 x4720	Fax: 508-435-9912	email: Jsirbak@thielsch.com	ERR

Protocol: NPDES

Lab Number (assigned by lab)	Your Field ID: (must agree with container)	Date Sampled	Time Sampled	Sampled By	Grab or composite (G/C)	Container No	Container Size (mL)	Container Type (P/G/T)	Field Preservation	Matrix S=Solid W=Water	Filter N=Not needed F=Done in field L=Lab to do	Analyses Requested\ Special Instructions:
7 001	Effluent Start	09/20/15 - 09/21/15	0800 - 0800	MNH	C	3	3750	P	4 C	Water	N	CDPP7DCR StartSample
8 002	Receiving Water Start	09/21/15	1300		G	3	3750	P	4 C	Water	N	CDPP7DCR StartDiluent

Relinquished By: [signature] Date: 9/21/15 Time: 1455

Received By: P. Voelbe Date: 9/21/15 Time: 2:55 PM

Relinquished By: Date: Time:

Received at Lab By: Date: Time:

Comments: Marine chronic assays will be conducted if effluent PPT is >1 at time of collection.

COC Number: A1012420

Sample Delivery Group No: Sept 2015

Page of

ESI

EnviroSystems, Inc.
1 Lafayette Road
Hampton, NH 03842

Voice: 603-926-3345
FAX: 603-926-3521

ESI Job No: 3 of 3
1509567

CHAIN OF CUSTODY DOCUMENTATION

Client: ESS Laboratory	Contact: Joe Sirbak	Project Name: ESS Laboratory - Kendall Station	
Report to: Joe Sirbak	Address: 5 Avenue D	Project Number: P0604	Task: 0001
Invoice to: Joe Sirbak	Address: Hopkinton, MA 01748	Project Manager: Joe Sirbak	
Voice: 508-435-9244 x4720	Fax: 508-435-9912	email: Jsirbak@thielsch.com	ERR

Protocol: NPDES

Lab Number (assigned by lab)	Your Field ID: (must agree with container)	Date Sampled	Time Sampled	Sampled By	Grab or composite (G/C)	Container No	Container Size (mL)	Container Type (P/G/T)	Field Preservation	Matrix S=Solid W=Water	Filter N=Not needed F=Done in field L=Lab to do	Analyses Requested\ Special Instructions:
9 003	Effluent First Renewal	9/22-9/23	0800 0800	MNM	G/C	3	3750	P	4 C	Water	N	CDPP7DCR 1stRenewal Sample
10 004	Receiving Water First Renewal	9/23/15	1100	MNM	G	5 3 MNM	3750	P	4 C	Water	N	CDPP7DCR 1stRenewal Diluent

Relinquished By: _____ Date: 9/23/15 Time: 1340 Received By: _____ Date: _____ Time: _____

Relinquished By: _____ 9/23/15 1900 Date: _____ Time: _____ Received at Lab By: Rene Nielsen Date: 09/23/15 Time: 1340

Comments: Marine chronic assays will be conducted if effluent PPT is >1 at time of collection.

COC Number: A1012421

Sample Delivery Group No: Sept 2015 Page _____ of _____

1509569

As part of each daily renewal procedure, pH, specific conductance, dissolved oxygen, and temperature must be measured at the beginning and end of each 24-hour period in each dilution and the controls. It is also recommended that total alkalinity and total hardness be measured in the control and highest effluent concentration on the Day 1, 3, and 5 samples. The following chemical analyses shall be performed for each sampling event.

Parameter	Effluent	Diluent	Minimum Quantification Level (mg/L)
Hardness *1	x	x	0.5
Alkalinity	x	x	2.0
pH	x	x	---
Specific Conductance	x	x	---
Total Solids and Suspended Solids	x	x	---
Ammonia	x	x	0.1
Total Organic Carbon	x	x	0.5
Total Residual Chlorine (TRC) *2	x	x	0.05
Dissolved Oxygen	x	x	1.0
Total Metals			
Cd	x	x	0.001
Cr	x	x	0.005
Pb	x	x	0.005
Cu	x	x	0.0025
Zn	x	x	0.0025
Ni	x	x	0.004
Al	x	x	0.02
Mg, Ca	x	x	0.05

Superscripts:

*1 Method 2340 B (hardness by calculation) from APHA (1992) Standard Methods for the Examination of Water and Wastewater. 18th Edition.

*2 Either of the following methods from the 18th Edition of the APHA Standard Methods for the Examination of Water and Wastewater must be used for Total Residual Chlorine analyses:
-Method 4500-CL E Low Level Amperometric Titration (the preferred method);
-Method 4500-CL G DPD Colorimetric Method.

or use USEPA Manual of Methods Analysis of Water and Wastes, Method 330.5.